

Springboard to knowledge



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Basic principles

1. Product management processes

The main goal for the product management process is to develop and maintain a learning platform that provides the best outcome for learners and teachers in educational institutions in all of our markets.

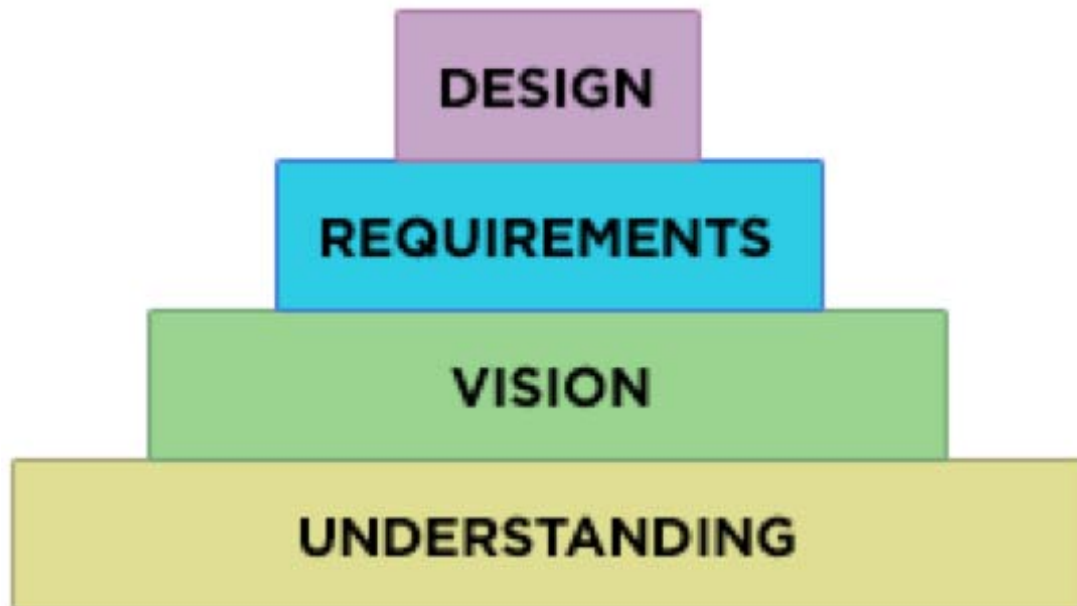
The basis for our product management process is a fundamental **understanding of the users'** desired outcome from a virtual learning environment. Ideas and suggestions are gathered from several sources:

- Workshops with invited customers, end users and experts
- Customers with support access
- Online User forum
- Advisory boards with specially invited members
- Research and pedagogical theory
- it's learning staff and partners
- Demands from markets and governments
- Competitors
- Technological trends

Based on our understanding of what features the end-users need, we formulate a **vision** for the learning platform. The vision is the foundation for all **requirements** which eventually define the design of it's learning.

The **design**, interface and functionality in it's learning are based on a set of key design principles which aim for:

- Better learning
- Useful features
- Ease of use
- An open and compliant product
- A rich user experience
- An elegant and motivating design
- Access for all
- A secure and bug free product



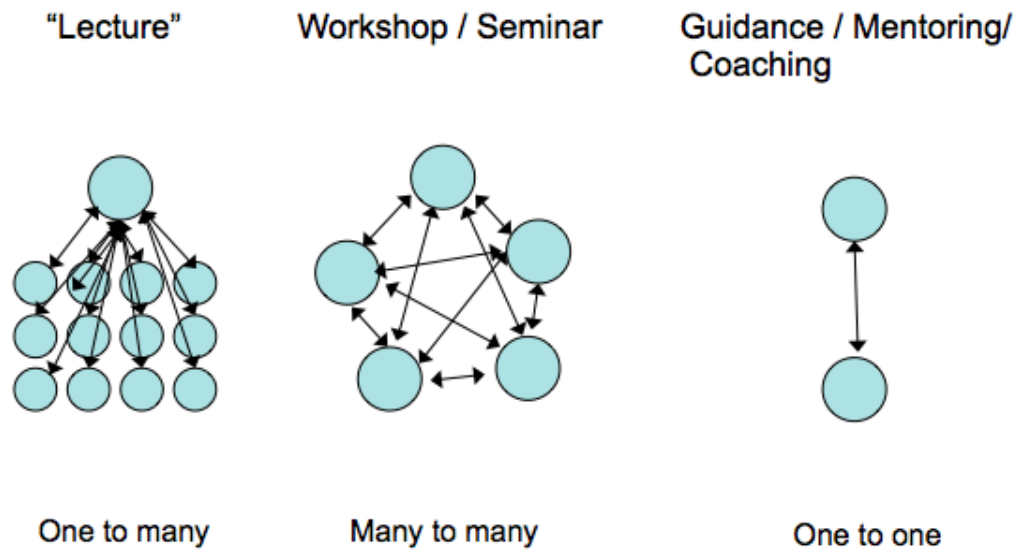
The product management process is continuous and flexible, and our goal is to release new features or improvements 6-8 times a year. Frequent releases give us flexibility to adjust the production plans to current priorities.

2. Pedagogy

It is important to us that it's learning supports different learning modalities, learning styles, teacher styles and teaching contexts. it's learning provides teachers with the possibility of personalising the learning processes so that materials and methods fit with the preferred learning modality and style.

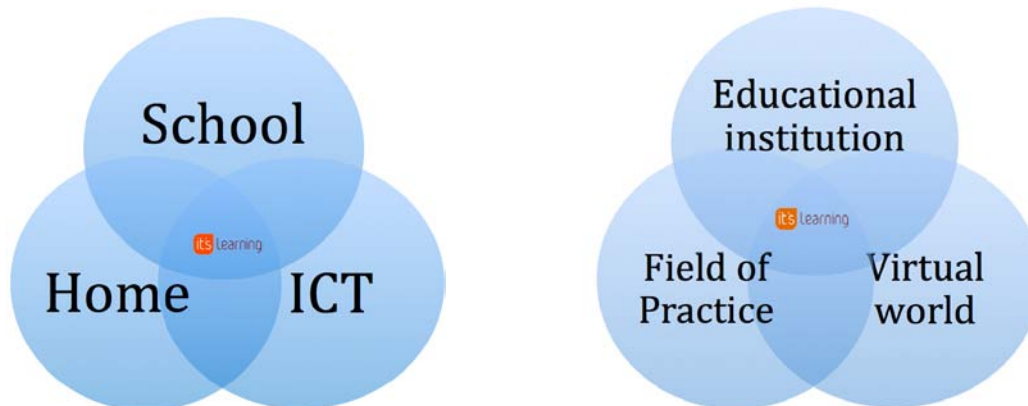
it's learning also gives the teacher the freedom and the possibility of operating in several teaching contexts and utilising optimal communication patterns.

Example:



Learners can collect, organise, share, discuss and present information and thus be personally engaged in the learning material. They can integrate new information with existing knowledge to build new understanding and they can reflect on their own learning process and knowledge in an individual or socio-cultural context.

it's learning can bring together many arenas in the learning processes. For young learners, one such arena may be the home. For older students such arenas may include tutoring while in-service or in-practice.



Key design principles

1. User-friendliness

User-friendliness is one of the most important features of a successful learning platform. A system that is easy to use results in a short training time for the end-users, efficient use, and ensures that users spend their time learning and teaching instead of wasting energy on trying to figure out how the system works.

The user interface in it's learning is the result of:

- Many years of experience of what works and what doesn't.
- Repeated usability tests with end-users, both teachers and learners.
- Expert advice on usability and accessibility for the disabled; usability guidelines from internationally celebrated experts such as Bruce Tognazzini, Jakob Nielsen and Steve Krug.
- International accessibility standards: W3C's WCAG¹ 2.0. it's learning meets these guidelines, in addition to the American requirements in Section 508.

For the user interface of it's learning this means that:

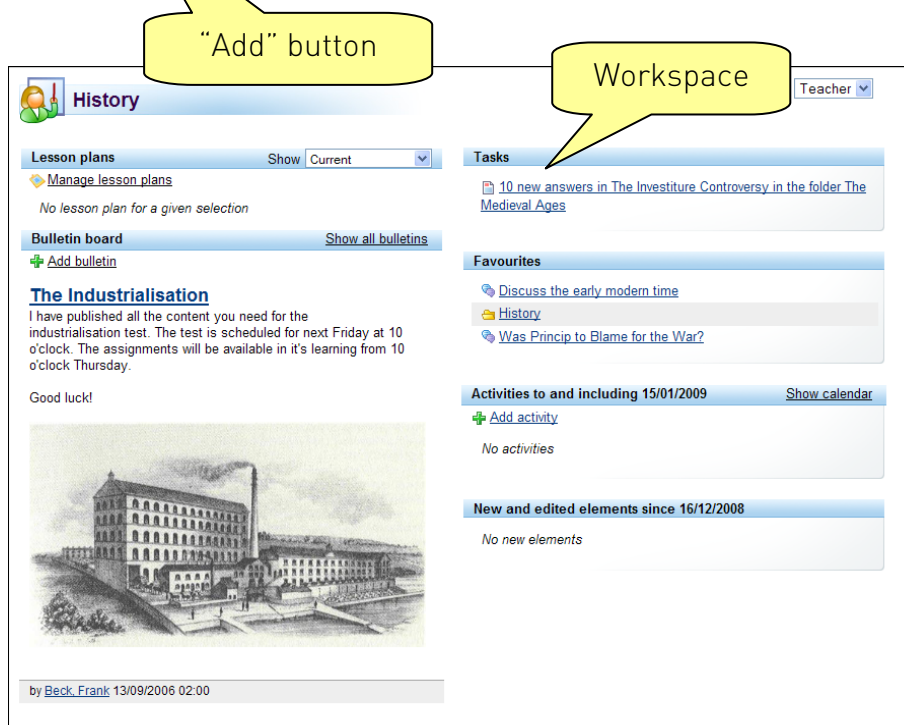
- Users always receive clear feedback on actions.
- The navigation system follows conventions, and the menu system is based on well-known standards, both from web applications and software.
- Clickable elements are perceived as obviously clickable.
- "Paths" and graphical marking in menus help the user keep track of where they are in the application.
- Users have simple and immediate access to the most common tasks.
- The page layout is clear, and prioritised elements are highlighted.
- Familiar symbols and interaction methods allow users to employ experience from other programmes and well-known conventions when using it's learning.

The screenshot below shows the basic structure of it's learning. The tabs constitute the main menu and are links to the most important tasks and objects, such as courses, messages, calendar, my files and settings. The tree menu on the left changes according to which tab and which element within the tab is active.

¹ WCAG = Web Content Accessibility Guidelines.

With the **Add** button, all tools are one click away. With this, the user can produce and publish a wide variety of content. Added elements appear in the tree menu under the course name.

The workspace where users carry out their tasks is the largest area.



2. Accessibility

This chapter describes accessibility in it's learning and how this is implemented in conformity with W3C's WAI Guidelines and section 508b in Americans with Disabilities Act (ADA).

Achieving a given degree of accessibility in a web application like it's learning is not only a technical issue. If accessibility is to be maintained there are also requirements regarding the content in the VLE, as well as the user's chances to interact sensibly with both the system and the content.

In other words, developing it's learning while keeping accessibility in mind involves a lot of balancing and knowledge of the disabled and their use of facilities and aids. We cooperate with leading experts who test it's learning with accessibility technology together with the disabled.

Guidelines from W3C-WAI² are normative in all work that involves keeping it's learning accessible to users with disabilities. For more information on our approach to these guidelines, see the table later in this chapter.

Feedback from our users is always one of our most important inspirations when we are designing our products and feedback from practical testing with the disabled has been given a higher priority than the aforementioned guidelines.

Support for navigation and orientation

The coding of all content delivered by it's learning is semantically correct. This means that headings, paragraphs, and so on, are used in the content of it's learning. If a browser is used that allows the user to use such semantics (lists of headings, frames and links, for example), it is an advantage to use these for quick navigation and orientation. Groups of links (menus) are organised in lists, but also contain facilities to skip the lists. In addition, a speed menu is implemented for tools that read the pages sequentially. The speed menu ensures quick navigation to important areas of it's learning.

Visual presentation

it's learning separates content from layout. The layout is presented with Cascading Style Sheets (CSS), while the content is a part of the XHTML document. This separation makes it possible for users with particular needs regarding presentation, such as high contrast or plain text, to override it's

² Web Content Accessibility Guidelines, WCAG 2.0, April 27th 2006 and Section 508 (1194.22)

learning's appearance according to their requirements. The same applies to text size, which can be changed using the browser settings.

it's learning and assistive technology

User tests have been carried out with blind and visually impaired it's learning users.

it's learning has been through several rounds of testing with facilities for tactile presentation (Braille writing) and aids for serial navigation used by the blind and the dyslexic. Various forms of magnification and alternative visual presentations that may be of interest to the visually impaired have also been tested.

The following table lists the assistive technologies used during expert evaluation and user testing:

Product Name	Primary Target Group
ReadIT	Dyslexia, low vision
Jaws	Blind
HAL	Blind
SuperNova	Blind, low vision
Lunar / Lunar +	Low vision
ZoomText / ZoomText Xtra	Low vision

Accessibility functions in browsers and combinations with adaptations by Windows are also tested, and may be used. See general technical requirements for more information on browsers and other necessary technology. A manual for learners and teachers who use it's learning with assistive technology is being produced and will provide more details on how it's learning can be used with assistive technology.

3. Client requirements

it's learning has no specific requirements for client operating systems. However, an updated browser is necessary.

Web clients

Bandwidth	56 k/bits or higher. Regarding performance it's learning should work globally.
Standards	it's learning requires a browser that supports XHTML 1.0*, CSS 2.0, ECMASCRIPT 1.2 and Sun Java.

	<p>it's learning is validated against these specifications and WAI 2.0 and Section 508.</p>
Browser	<p>it's learning is tested in the most common browsers which, right now, are the latest versions of Internet Explorer, Firefox, Opera and Safari. Our aim is to support new versions of browsers within 6 months of the browser being released.</p> <p>Browsers and browser versions tested with it's learning will change over time, and news about updates will be found in our blog, on our website or in newsletters. In some instances, there are errors in the browsers regarding compatibility with the specifications. In such cases, it could be necessary to update the browser to the latest version or service update.</p> <p>All service packs, updates and security patches must be installed as soon as they are available.</p>
Operating system	<p>No specific operating system is required on the client. it's learning is tested against the most common operating systems which, in 2008, were Windows XP, Windows Vista and Macintosh OS X Leopard. it's learning is also tested in Ubuntu.</p>
Screen resolution	<p>Minimum 1024 x 768.</p>
Ports	<p>Ordinary use requires that port 80 (HTTP) and port 443 (HTTPS) are open. The video and sound recorder requires port 1935 to be open.</p>
Character set	<p>it's learning uses the ISO-8859-1 (latin1) character set as default. In addition, it is possible to use mathematical characters (Math ML) in the internal equation editor and Unicode text can be used as content.</p>
Plug-ins	<p>Java: To use some special functions in it's learning, such as the equation editor, the note editor, the tool for larger file uploads and SCORM, Java must be installed on the users' computers.</p> <p>ActiveX: it's learning contains an ActiveX component (Direct Edit). This component makes it possible to edit files directly in the browser. The component only works in Internet Explorer when it is run from a Windows operating system.</p>

Readers for different file types: it's learning supports the uploading of a number of different files and formats. To use different file types, it may be necessary to install different software on the web client. The most common are: Flash, Shockwave, Authorware, RBX and Microsoft Mediaplayer.

* XHTML exceptions:

- By using the accessibility mode in it's learning, it will be full XHTML 1.0 Strict/Transitional support.
- If the accessibility mode is turned off, the frameset will use frameborder and framespacing to make the frameset more user-friendly.
- Lessons created in the Library will not support XHTML.

4. Interoperability

E-mail

it's learning supports both POP3 and IMAP4. This means that regular e-mail accounts from external Internet Service Providers can be set up in it's learning. External e-mail may be sent and received via it's learning if an external e-mail account is set up.

RSS



RSS is an acronym for Really Simple Syndication and Rich Site Summary. RSS is an XML-based format for content distribution. RSS files contain headlines and descriptions of specific information. In it's learning, RSS is used for news published at site level.

RSS is based on XML and its purpose is to deliver updates to web based content. Users can use specific RSS readers to download headlines and fresh content from it's learning. Some e-mail readers, such as Mozilla Thunderbird, have a built-in RSS reader and the RSS feeds are downloaded in the same way as e-mail.

RSS XML

Import and export



The IMS Global Learning Consortium develops and promotes the adoption of open technical specifications for interoperable learning technology. Several IMS specifications have become worldwide standards for delivering learning products and services. it's learning follows the IMS Content Package, IMS QTI and IMS Enterprise.

The IMS Compliance Program improves interoperability in the worldwide implementation of IMS Specifications by establishing realistic measures of interoperability and increasing those measures over time, as best practice and more rigorous testing capabilities become available.

The program is governed by the IMS Compliance Program Policy. Vendors of Conformant Products receive the right to use the IMS Conformant Logo and are included in a public list of Conformant Products. The IMS Compliance Program is administered by the Wisconsin Testing Organization.

IMS Content Package Version 1.1.4: IMS has established standards to enable the packaging and exchanging of content between environments. IMS Content Packaging is a specification for sending learning resources from one program to another, facilitating the easier delivery, reuse and sharing of materials. it's learning supports both import and export. it's learning validates each package, and if any packages contain errors, the users receive a warning. it's learning was certified by the Wisconsin Testing Organization on December 8th 2005.

IMS QTI Version 1.0 and 2.1: QTI stands for Question and Test Interoperability. IMS QTI is a standard that supports importing and exporting of questions and tests between environments. it's learning can export and import all the current types of questions and tests used in it's learning.

IMS Enterprise Version 1.1: is an international standard XML format which can be used to specify enrolments and cancelling of enrolments in courses, course information and user information. it's learning supports import. it's learning was certified by the Wisconsin Testing Organization on January 20th 2006.

IMS Enterprise Services Version 1.0: Built on the data model from IMS Enterprise this specification defines a web service interface that allows creation, updates and deletes to user data in it's learning. This integration is in widespread use in the UK marketplace for integration with Capita SIMS.

SCORM: SCORM (Shareable Content/Courseware Object Reference Model) 1.2 and 2004 is supported by it's learning. SCORM is a web-based e-learning standard. it's learning supports import and runtime environment.

it's learning allows you to import zip packages with files. The content package can be imported from any SCORM 1.2 and 2004 Conformant VLE.

AICC

AICC is an acronym for Aviation Industry CBT (Computer-Based Training) Committee. In it's learning, it is possible to make courses accessible to external users by allowing AICC communication. This means that users from competitive Virtual Learning Environments, such as Blackboard, can use courses created in it's learning.

AICC also makes it possible to share courses between different it's learning sites by making it available in it's learning Community.

AICC is also used to run content from other websites in it's learning.

XHTML 1.0 and CSS 2.0



The it's learning user interface is made in XHTML 1.0 (Extensible HyperText Markup Language). XHTML is an XML-based family of current and future document types and modules that reproduce, subset, and extend HTML 4.



Cascading Style Sheets (CSS) is a simple mechanism for adding styles (fonts, colours, and spacing, for example) to Internet documents. In it's learning, the content (XHTML) is separated from the interface (CSS and images). This helps to make the application accessible. CSS is only a formatting language, and if the CSS style sheet is turned off, then the content is shown as semantically correct without formatting. Few other applications have this separation of layout and content.

5. Software as a service

One of the key elements that set it's learning apart from more traditional software is the fact that it is delivered as a service. This means that the software itself is hosted and supported by the vendor and can be accessed by users via the Internet without the need to deploy and maintain an on-premises IT infrastructure. This delivery model is often called "Software as a Service" (SaaS) and is the key to the success behind many famous "Web 2.0" web applications such as Gmail, Flickr, Facebook and Hotmail.

The flavor of SaaS that it's learning offer is called "Enterprise SaaS". "Enterprise SaaS" (sometimes unlike consumer based SaaS) acknowledges the enterprise needs for ownership of data, security, Service Level Agreements and managed support. All of our customers are guaranteed 99.7 % uptime 24/7 and we commit to ensure that the performance of the

application is acceptable (>2 sec/99% of all requests) without any limitations on scalability/usage. We protect our customer's data and ensure that the service offers compliance with regulations like the Personal Data Act. it's learning also guarantees the backup of customer data.

Example of actual uptime of www.itslearning.com :

Month	Percentage
March 2008	99.86 %
April 2008	99.99 %
May 2008	99.97 %
June 2008	99.96 %
July 2008	99.97 %
August 2008	99.99 %

Example of actual response time for www.itslearning.com:

Period	Number of pages sampled	Average response time
08.09.09 – 14.09.09	19,609,077	0.210 sec

Software delivered as a Service is often regarded as being a significant contributor in lowering the total cost of ownership of IT systems. There is no need for hardware, OS and software to be installed locally, so direct costs and indirect costs (IT resources, training, and competence) are eliminated. The subscription price model also eliminates the need for large up-front investments and makes it easier to move to other platforms without being limited by technology, IT competence or hardware/software write-offs.

Perhaps the greatest benefit for educational institutions that choose a SaaS approach is that instead of having to worry about technical challenges in the implementation process, time and resources can be spent on implementation on a pedagogical and technological level. For many educational institutions there are no real alternatives to a SaaS approach when purchasing a learning platform. Very few individual schools would have the staff, resources or competence to set up the complex IT Operation that is necessary for a 24/7 mission critical system like a learning platform. The core of SaaS, browser based delivery anywhere over the internet, also lends itself very well to the heterogeneous IT environment found within educational institutions.

The SaaS model allows us to continuously implement change and improvements to our software without having to use a lot of resources on upgrading customers at different locations. We currently upgrade it's learning

6-8 times a year, and the updates are installed automatically. The customer is not involved in the installation process, but will be notified 14 days ahead of an upgrade if it requires downtime. Delivering it's learning as SaaS gives our customers access to updates and new versions without any investments in application licenses, staff, servers or other resources.

Physically, the servers running it's learning are today located at the entry point for the Norwegian Research and Education Network at the University of Oslo. This is a highly secure environment with strict access control and sophisticated fire protection. The hosting environment comes with redundant cooling, power, networking and UPS. Because of the close connection to the national REN, bandwidth is virtually limitless and ping times to other global networks are very low.

6. Compliance

it's learning has a history of strong commitment of compliance with regard to the EU Directive 95/46/EC and the Personal Data Act.

Even though it's learning is hosted by the supplier from a central hosting location, the customer has full ownership of all data stored within the application. The customer is defined as the data controller and determines the purpose of the processing of the personal data. it's learning is only a data processor that processes personal data on behalf of the controller and cannot act without instructions from the data controller.

It is the data controller's responsibility to ensure that the processing of personal data is in accordance with the laws and relevant regulations. However, we are committed to support our customers in fulfilling this responsibility. This is done through dialogue with our customers, making relevant documentation available and ensuring that the Learning Platform contains functionality that makes it easy to comply with the current legislation.

As a data processor it's learning has independent responsibilities with regard to the existing Personal Data Acts. The data processor must take appropriate technical and organisational measures against unauthorised and unlawful processing of personal data and against accidental loss or destruction of, or damage to personal data.

At it's learning, the organisational measures are documented in the "Internal Control System" implemented within the organisation. This includes Risk Assessment, breach procedures, privacy policies and security policies.

Technical security is heavily built in to the hosting environment of the Learning Platform. Physical and remote access to the data is limited to employees that have the necessarily training and competence. Heavy encryption, VPN and IP

access list security prevents unauthorised access to personal data. All customer data is backed up both on on-site and off-site backup locations. Backups of up to seven versions of a file are stored for three years after the file is actually deleted from the Learning Platform. Customers are also recommended to enforce the use of SSL (encrypted HTTP) for all user profiles within it's learning.

The Norwegian data inspectorate performed an inspection of the supplier's Norwegian operations to ensure it was in compliance with the Norwegian Personal Data Act (also aligned with EU Directive 95/46/EC). The result of the inspection was that the data inspectorate had no remarks on the way the supplier fulfilled the obligations of a data processor.

7. Quality assurance

it's learning has a quality assurance team to:

- ensure quality products
- reduce the number of bugs by identifying and resolving existing bugs, and minimise the amount of new bugs

Development and quality assurance

The QA team create test plans and tests everything that is delivered by the developers. Test scenarios are written which illustrate what the testers need to test, and what to look for to avoid introducing bugs to the production environment.

The QA team starts executing test cases after the developers have finished developing. All testing focuses on the following:

- Functionality
- User interface
- Security
- Performance

Bugs and issues found during testing are reported as defects by the testers. The testers set priority and severity statuses for all defects and the developers correct defects in the order dictated by the priority and severity.

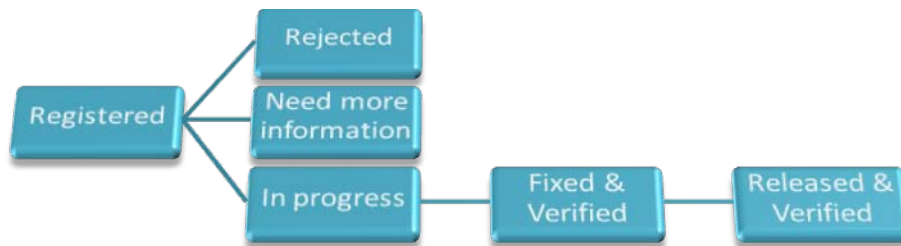
Each task receives the "Accepted" status when the developers finish coding it, and all test cases have passed without detecting any defects.

After a release, the QA team performs regression testing and verifies the new package in the production environment. If it is verified as ok, it is released. If any problems are detected, a decision to roll back the release could be made, depending on the severity of the problems.

Quality assurance and bugs

The bugs that are registered in our bug tracking system are primarily registered by customers and our support department. All bugs that are registered in our system get the status “Registered” as default. The QA team works continuously with these as they are registered, confirming them and changing statuses as they move through the system.

The approved bugs are collected in a backlog waiting to be fixed during a development iteration. The basic workflow from the perspective of the QA team is illustrated below:



Description of the different statuses:

Registered	Registered bugs
Rejected	A registered bug that has been checked and found not to be a bug
Need more information	A bug that does not have enough information to be able to be recreated. The support department communicates with the customer to get more details
In progress	A bug that is fixed in a sprint gets this status as soon as it's fixed
Fixed and verified	The bug has been deployed to the verification environment and verified to work
Released and verified	The bug has been deployed to production and verified to work

Operations and quality assurance

From an operational perspective, hosting it's learning is a large and complex operation. Not only are software changes introduced frequently but the number of concurrent users logged on to the platform is increasing rapidly. To ensure operational quality of service in such a dynamic environment we have adopted a range of management processes from the ITIL Framework (Information Technology Infrastructure Library).

8. Administration and security

Infrastructure security

it's learning's hosting environment is protected by several layers of network security based on both hardware and software solutions.

The first layer of security is a more traditional network gateway (firewall) that uses access list technology to control the access of ports and IP addresses. This device will, for instance, limit application access to only the required ports such as port 80/443. This layer of security also limits public traffic to the front-end network of the server environment. This means that incoming traffic is restricted to front-end web servers only and cannot access back-end database or file servers.

The second layer of security is a layer 7 content switch that further filters the incoming content and checks that connections are in accordance with the current white paper standards for filtering out malformed or incorrectly formatted packets (for instance to stop a "Denial of Service" attack or the spread of a network virus). The content switch will also isolate traffic from different customers to different server pools and thus limit the impact if a serious incident should occur. All https termination also happens on the content switch, limiting the number of servers that hosts it's learning's private keys for SSL traffic.

As a final layer of security, every server is routinely updated with patches and the configuration of the web/application server is done in accordance with industry best-practice to ensure that no known vulnerabilities can be exploited in our server environment. Every server also has network cards to physically separate back-end and administrative traffic from front-end traffic.

Application security

To allow access to the program it is required that every user inputs a username and password (encrypted using 128bit SSL certificates). The application allows for different security regimes to be implemented for it's native authentication. For instance, the application allows the following parameters to be set:

- Password complexity and minimum length
- Password change frequency
- Number of allowed log-in attempts before the user account is deactivated.
- IP check (accounts can be assigned specific IP addresses).
- To what degree the user is allowed to create HTML/JavaScripts

If additional security is required, it's learning can be integrated with external authentication sources such as Active Directory or eDirectory. This will, for instance, allow functionality to be expanded into PKI solutions or other added layers of security.

The application logs a wide range of security information. All attempts to log in (successfully or denied) are logged with information about the client (IP addresses) and the submitted username. Every time a user updates or deletes common data elements within it's learning, the time and username information is logged. In addition to this all http requests are logged on the IIS server. Combining this information makes it possible, in great detail, to identify who, when, where and how a security incident happened.

Organisational security

A number of organisational measures are in place to limit the possibility of unauthorised access. Several of these measures are built around the best-practise ITIL framework that is the foundation for our service support and delivery. There is an incident management and problem management system in place to ensure that issues regarding security are handled promptly and without any unnecessary delay. There are procedures in place to control changes and manage releases of updates to our software in a way that limits the possibility of vulnerabilities being released. These procedures also allow for security patches to be quickly released in case vulnerability becomes known.

In addition to this, as a service provider processing user data on behalf of our customers, an internal control system is in place to ensure that our operations, services and software are in full compliance with EU law and the Personal Data Act.

9. Information and communication

All important information from it's learning to our customers is posted on our blog:

- **Direct link:** <http://www.itslearning.com/itslearning/public/blog/>
- **RSS feed:** <http://www.itslearning.com/itslearning/public/blog/rss/>

The blog contains information specific to the products we launch, such as the content of updates and patches, product news and information about downtime.

Problems?

Bug reports and questions about product features may be directed to our helpdesk at <http://support.itslearning.com>.