

Halden Virtual Reality Centre

Applying advanced visualisation technologies and human factors to real world challenges



Layout Design, Planning & Review

HVRC CREATE

HVRC CREATE is a suite of tools for interactively designing and testing work-space layouts from a human-centered perspective

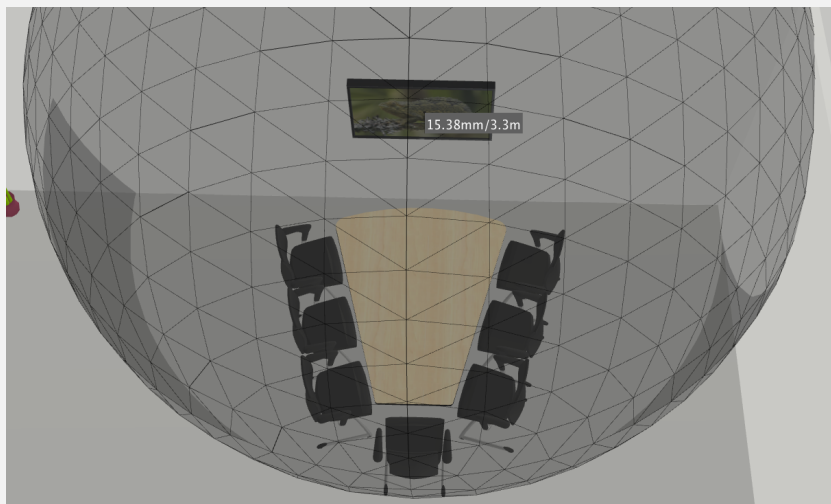
- Supports an iterative design-test process with multiple participants and end-user participation
- Provides a version management facility for tracking and documenting design iterations
- Uses interactive 3D technology to enable designers to rapidly prototype and test designs with reference to guidelines and recommendations

Background

HVRC CREATE is a suite of tools intended for use by managers, designers, reviewers, and other parties involved in a human-centered design process in which the layout and ergonomics of a work environment are in focus.

It is particularly suitable to iterative design processes with end-user participation and strict formal review requirements. While it has many potential application areas, it was originally designed specifically to support the design of complex control centres, such as those in the energy and process industry.

HVRC CREATE combines advanced interactive 3D technology with web-based file management and version control, providing an integrated package that supports and traces the various stages of the design process.



The HVRC CREATE Concept

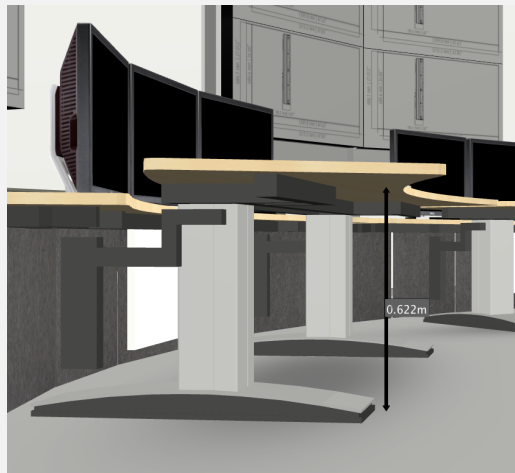
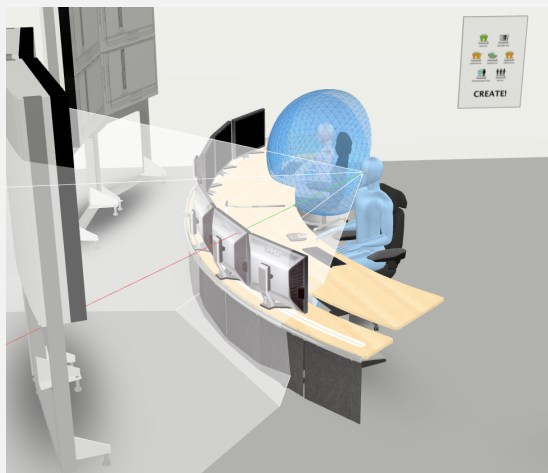
HVRC CREATE has been designed to support an interactive design methodology, where a room or environment layout is refined and tested many times before a final design is reached. This contrasts with traditional design methods where the number of possible design iterations is limited by the cost of constructing adequate physical mock-ups. When CREATE is used, it is not necessary to build an inflexible physical mock-up, so greater emphasis can be placed on finding an optimal design or planning solution.

Layouts are created using an advanced drag-and-drop user interface that is both simple to use and very powerful. The user simply drags objects directly into a 3D model of a room. The software automatically maintains associations between objects, such as which desk a telephone has been placed on so that groups of objects can be intuitively moved around.

Formal design testing against guideline such as NUREG 0700 and CRIOP can be performed with the assistance of the system's review data management facilities, and a selection of powerful 3D measurement tools and manikins. For example, sight lines, view cones, viewing angles, text size/distance ratios, can be visualised. The same 3D tools are available to the designer for informal testing as the layout is constructed.

HVRC CREATE provides features designed to support and enhance communication between the various stakeholders involved in a design project. Support for communication between layout designers and reviewers is integrated into the system, and it is possible to extract electronic documents such as models, designs and review reports for distribution to other parties. Designers can annotate room layouts and annotations can be read by reviewers.

The software is based on cross-platform Internet and Java technology and open standards including ISO VRML97, DAE/COLLADA, XML, and HTML.



Credits

The first version of HVRC CREATE was developed by Halden Virtual Reality Centre in collaboration with EDF.

HVRC CREATE Key Features

Powerful layout-oriented design and planning tools for both rapid prototyping and formal review

- Designers or planners can create layouts of environments in 3D using an advanced and intuitive drag and drop method
- Objects automatically align to surfaces and can be rotated interactively
- Manikins and measuring tools can be used to test a layout design
 - distance and angle measurement
 - viewing angle and label size visualisation
 - manikins with view cones, lines of sight, reach and manikin view features
- Participatory design and planning techniques are possible and encouraged
- Provides version control and reporting features

Supplied with templates to create your own design and review guideline sets

Supplied with a collection of models, and CRIOP & NUREG-0700 Rev.2 review guidelines

Imports ISO VRML97, COLLADA, & KMZ 3D models

Imports JPEG, PNG and GIF images

- 3D models can be imported into the Model Bank database from most 3D modelling packages
- Model Bank can be used to archive 3D model data (e.g. 3D Studio or AutoCAD files) with the ISO VRML 3D models used by HVRC CREATE

Can export 3D models in ISO VRML97 format, 2D images in PNG & JPEG format, and HTML reports

Web-based system architecture

- Internet/intranet architecture
- Server based on Web server technology
 - Administration and Project Tools are clients that manipulate data on the server
 - Supports multiple users with passwords
- Users share data "transparently" without geographical limitations
- Provides version control facilities
- Centralised storage of data
 - Facilitates backup, reduces risk of losing system and project data

English, French, and Norwegian language support

Mac OS X 10.8-10.11 and Windows 7/8/10 support (all 64-bit). Linux x86 available on request.

Online user manual facility (English only)

The layout design, planning and review tools are easy to use for designers without 3D CAD experience. 3D modelling experience is only necessary to create new models for the Model Bank database using conventional 3D modelling tools.

Designed on the basis of many years of human factors research and experience in control room design as well as research into the application of virtual reality technology to complex design and planning activities

Institute for Energy Technology (IFE)

With over 550 employees, the Institute for Energy Technology is Norway's second largest technological research institute. The institute's activities in Halden have a strong foundation in international scientific cooperation for over forty-five years. More than 100 organisations in 20 countries participate in the OECD Halden Reactor Project, which IFE administers under the auspices of the OECD. IFE is a major international R&D centre for information, safety, and environmental technology.

Halden Virtual Reality Centre (HVRC)

The Virtual Reality Centre at IFE was established in 1996 and builds on IFE's vast experience with advanced graphical visualisation technologies and human factors, accumulated since the early 1970s. Approximately half of HVRC's activities are research activities for the Halden Project. The remaining activities comprise of applied R&D, and consulting for individual customers.

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