

Siemens Creates One Infrastructure to Train Staff, Clients Globally

Siemens AG Healthineers
Best Advance in Creating
an Extended Enterprise Learning Program
November 2017



Company Background



Company At-a-Glance	
Headquarters	Erlangen, Germany
Year Founded	1872
Revenue	75.9 Billion Euro
Employees	42,000
Global Scale	120 countries, 9 languages
Customers/Output, etc.	>50,000
Industry	Healthcare
Stock Symbol	SI
Website	siemens.com

Budget and Timeframe

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Overall budget	\$5.9 million
Number of employees involved with the implementation?	37
Number of Operations or Subject Matter Expert	37

employees involved with the implementation?	
Number of contractors involved with implementation	2
Timeframe to implement	Ongoing
Start date of the program	July 2015

Business Conditions & Business Needs

Siemens AG corporate created a separate division, “Healthcare of Tomorrow” (HoT), and made it responsible for providing global, consistent training to support its clients in the changing healthcare environment.

Over the past decade, the global healthcare market has experienced significant changes with an increase in emerging markets, a global debt-driven crisis, consolidation, expanding Accountable Care Organizations, more healthcare staff requirements and patient demographic changes. At the same time, the technological training landscape – smart devices, cloud-based computing, metadata – caused a radical shift that impacted society and individual behavior.

As a result, greater demand has been placed on healthcare professionals to maintain a high level of competency with complex diagnostic instruments and continuous regulatory changes.

Siemens AG is a leading provider of healthcare technology, including medical resonance imaging and computed tomography, and laboratory diagnostics.

For two years, Siemens leaders evaluated the healthcare sector’s impact on the organization and the need to reduce operating redundancies and streamline business practices. HoT was formed in 2016 and the company rebranded its training to “Siemens Healthineers” to raise awareness of its role as an enabler of healthcare providers worldwide.

The focus of HoT was to outline a highly trans-matrixed organization with a global standard strategy and regional flexibility for the countries to better serve their customers and meet local legal requirements. The new organization introduced six regions, six global Business Areas (BAs), and multiple global functions.

In response, the Siemens education team created an internal infrastructure capable of delivering training that can evolve with the future of technology through a hybrid-cloud solution, the Healthcare Integrated Learning Solution (HILS), with PEPconnect as the interface for the user.

However, some diagnostic imaging customers do not use PEPconnect, so the HILS platform needed to expand to include in-vivo learning content and become the sole learning platform for all Siemens Healthineers. The launch rolled out with 1,000+ learning activities to support the diagnostics imaging side of the business. HILS was the only platform with capable of such a feat.

Overview

HILS is an internal, turn-key solution comprised of multiple integrated tools, deployed through the PEPconnect and POckit interfaces. HILS offers evolving content rich in interactivity, multi-media, and flexibility for future evolution of virtual education.

In 2011, Siemens created a personalized education plan for customers and added PEP administrator in 2012 to provide a compliance and management solution to assign, manage and track the competencies of staff. At the same time, Siemens added cloud-based video streaming, webinar services, and e-commerce integrated through smart APIs to expand the reach of the PEP solution.

Since the HILS webinar solution leverages smart APIs, a curriculum could be designed to include competency-based, synchronous or asynchronous webinars in a single integrated solution. This change allowed the learner to review all activities within a transcript, provided business transparency over all activities, and increased metadata for stronger analytics. This single solution eliminated the need for five other vendors with different interfaces.

Siemens POckit, introduced in 2014, connects people to knowledge with performance support anytime, anywhere, and from any device. With 100 activities, more than 75,000 page views, 100,000 accesses, and a return user rate of 60%, POckit continues to be one of the key education resources for critical care healthcare professionals.

Integrated Infrastructure

HILS powers and integrates all those programs, bringing all development and support activities in-house. As a result, development and media production across all learning activities has been reduced to \$5,000 per course, resulting in more than \$20M in total



savings. Development time has been cut 67%. Now, development only requires three months and two handoffs, as opposed to six months and 24 handoffs. Implementing the translation engine has reduced localization costs by 90%, saving more than \$30 million on approximately 1,000 courses in local languages.

As part of the HoT initiative, the platform was introduced to the organization as the single education infrastructure supporting all regions, business areas and users within Siemens Healthineers. HILS is a single integrated learning solution, available globally to customers, employees and partners. HILS includes:

- **A single integrated solution.** Cloud-based, comprehensive suite of analysis, design, development, translation, assessment, management, administration, and deployment tools to provide a single experience for Siemens customers, employees and partners globally, to access all education and performance activities, anytime, anywhere, from any device
- **Globally standard, regionally scalable.** Infrastructure to curate education, performance activities, and curricula that can be customized based on regional and market needs, offering a globally standard model and design, with flexibility
- **Personalized experience, flexible construct.** Virtual learning spaces that can be personalized by the individual learner to create meaningful connections, delivering multiple activities and platforms.

Tools with HILS

HILS contains a series of tools that allow Siemens to design, develop, and deliver solutions and experiences that can evolve with technology and grow with the learners' needs.

- **Application program interface integration.** Allows for easy integration of external tools and solutions with overall HILS suite, providing adaptability for future additions.
- **Integrated Translation Tools.** Allows content to be translated and localized with Siemens resources (personnel and intellectual property), reducing cost of localization by 90% and time to market.
- **Virtual office.** For centralized management with single-source content, data, and reporting with multi-tier service and restricted access security, eliminating data security risks.



- **Browser agnostic technology.** Allows interface and content to be accessed and viewed on all web browsers; instructionally sound design and development tools and templates support all ISD, learning theory principles and learning practices, creating an optimal learning environment.
- **Content Development.** Allows instructionally sound design and development tools such as content editor and assessment engine for educational and performance support.
- **Integrated Webinars.** Provides single access for all education, delivered as independent objects or part of a curriculum, creating a single-source solution for users.

PEPconnect and POckit are graphical user interfaces hosted on HILS and include the following features:

- HTML5 coding that is compatible with all devices; remains current with latest technology.
- Responsive design adaptive to any screen, from laptop to tablet to smart phone, with no duplication or administration tasks.
- Commercial product integration with the ability to integrate with hospital LMS systems to meet compliance and competency requirements. This feature is innovative and responsible, ensuring educational support to customers who operate Siemens instruments.

Additionally, Siemens Healthineers owns all the code and language IP rights for HILS, enabling cost effectiveness by eliminating the need for contracted services.

PEPconnect, as the next generation in education, provides a personalized education experience by connecting people to knowledge, anytime, anywhere, on any device. With PEPconnect, content is available via unique URLs, eliminating the need to register/login and allowing learners to explore the catalog and rapidly access content. This change offers an experience similar to familiar websites such as YouTube for increased understanding and sharing.

With HILS' single infrastructure, learning programs were reevaluated as part of the "Diagnostic Application Project" (DAP). Virtual Education Solutions (VES) was transferred to the most profitable business areas and services. VES retained focus on sales education



but assumed global responsibility to deliver a broader portfolio and reach a broader base of healthcare professionals.

Transitioning to be one of the 12 service areas within CS Apps required VES to designate a core group on sales needs, ensuring a focus on 4,000 sales employees, 12,000 service employees, and healthcare customers. This new directive expands Siemens' reach. True value is provided through differentiating and revenue-generating education services that support the business, drive performance growth within the sales force, and provide growth opportunities for individuals within VES.

In the past decade, VES' commitment to improving virtual education has been the most influential factor in HILS being selected as the sole platform for all of Siemens Healthineers. Over the past year, the VES team strengthened its commitment to increase awareness within in the larger organization with a better understanding of PEPconnect. Specifically, VES is focused on increasing the volume of diagnostic imaging content on PEPconnect. HILS has enabled VES to design a new commercial model, create a virtual social enterprise and deploy education via PEPconnect to support productivity measures within CS APP's blended learning strategy.

Design of the Program

With the continuous changes in healthcare, technology, and societal behavior, the VES team recognized the need to transform Siemens' learning vision and approach. The vision was revised: "To become the largest provider of global virtual education, performance support and cloud-based services."

The mission increases commitment to the learner, creating space for each learner to control his or her own education. In other words, customers access information and create new knowledge in ways and speeds that were not possible just a few years ago.

Technology as Catalyst

Tools within the HILS platform are categorized into groups, including administration, content, and consumption, and into tiers such as HQ layer, country layer, and customer layer. PEPconnect and POckit are included within the consumption category, which is directly available to customers.

- **PEPconnect.** Personalized front-end interface for education and information; utilized by customers, employees and channel partners to create a smarter



connection of people to knowledge. It is designed to increase staff competency, efficiency, and productivity for the overall healthcare environment.

- **POCkit.** Performance support solution utilized by critical care staff in the emergency room and across the healthcare system. POCkit connects people to knowledge with just-in-time performance support, anytime, anywhere from any device.

Tools within the content category enable execution of all learning activities available to viewers:

- **Content manager.** Provides the ability to assemble PEPconnect Training Areas from content developed in CE, AE or translated in TE, and includes content segmentation for employees versus customers.
- **Content editor.** Utilizes multiple media components for courses, exercises, and checklists; supports high-fidelity content creation with interactive templates and editing of existing trainings and the ability to export all content into .doc and .pdf files for review.
- **Assessment engine.** Custom assessment options with banking, weighting, and pooling to supporting summative and formative assessments within or independent of a course, as well as qualification and certification assessment needs. Assessment engine provides integrated and independent assessments, pulling from the question bank with randomization, weighting, and controls.
- **Intelligent translation engine.** Intelligent translation memory database utilized and grown by internal industry and languages experts. Content follows QR7, including verification of translated content by native speakers. Translation memory is currently available for 17 languages with potential for unlimited expansion.
- **Webinar solution.** The integration of a single webinar platform streamlines all business processes for four separate areas utilizing four separate vendors, reducing cost and time and improving the customer and employee experience.
- **Events Engine.** Used for registration and records live or in-person events, and enables webinar, seminar, and symposium conception, planning, and recording.

- **Video streaming.** Hi-definition video streaming for courses and independent performance support, providing an array of video formats and file sizes for internet connectivity.

Administration platforms such as HILS/MyTraining, Global Administrator, and HILS for Partners allow for internal management of various pieces of the holistic solution. Administrators are provided segmented access based on roles and responsibilities:

- **HILS/MyTraining.** The original Siemens LMS formerly known as TCmanager is the employee gateway to PEPconnect with employee data, classroom resources, and customized assignments.
- **Global administrator.** Main administration of HILS at HQ interacting with (DX) TCmanager, PEPconnect, HILS for Partners, and PEP Administrator at customer sites for personnel and data management of all education activities.
- **HILS for partners.** Siemens Partner Managers distribute HILS and its offerings to partners to segment country content based on confidential agreements.
- **PEP administrator.** Prior management and administration tools for education assignment, tracking and compliance management, used by customers, employees and channel partners This tool was being redesigned to integrate within PEPconnect and will be relaunched in Q4 of FY2017.

Each region or area manages its own business based on operating practices and provides HILS the opportunity to customize and revolutionize the healthcare education industry to support priorities and learning needs, while Siemens Healthineers manages everything internally. Ultimately, whether a new project, new product, or translated activity, the goal is to build and deliver education with efficiency, low costs, and short-cycle times. Since the majority of HILS exists within Amazon Web Services (AWS), it is possible to fulfill business or user requirements, such as utilizing e-Commerce and Google Analytics to provide an enhanced overall experience. With HILS, VES created a flexible infrastructure that allows a larger team and network to continue to innovate, build new content, and integrate technologies within a larger, hybrid cloud solution.

Delivery of the Program

HILS is leveraged across various areas of the organization, therefore delivery channels vary and include:



- **New product launch.** Full curriculum for all medical diagnostic and laboratory devices.
- **Product health.** Updates and makes additions that are evergreen to ensure proper practices within the healthcare space.
- **Clinical initiatives.** Provides a holistic approach to education.
- **Business initiatives.** Internal education on such topics as branding and compliance required of all employees.

Siemens meets the needs of those needs by supporting more than 100 trained employees in the HILS developer and administrator network. VES liaisons bring specific expertise in and business background in their respective areas. They also are members of global groups to ensure implementation and adoption are successful.

The HILS ambassador community, including 45 employees at manager levels or above are part of the HILS ambassador community responsible for marketing and communication to their customers, employees and marketing and training center managers. All of them have business area and/or regional responsibility. This global group meets monthly to discuss best practices, advances in technology and new marketing and commercial strategies, and the members align themselves to provide a single global message internally and an external presence for a single solution.

Subject matter experts, as part of the Subject Matter Network, assess learning needs and potential new innovations. This team collectively defines the industry and organizational needs, performance expectations, curriculum, content, deployment and ongoing support. Using internal design and development tools, these consultants provide multi-modal, blended delivery options for employees and customers.

Web-based, front-end analysis tools, following the ADDIE model of instructional design, are used to identify the appropriate learning objectives and delivery methods for each competency, integrated content development tool, back-end translation engine, and content administration site.

HILS' single solution has allowed the organization to sunset more than 30 LMSs and 100 authoring tools and to introduce more than 1,000 in-vivo learning activities to users. With the various teams trained on HILS tools and processes, global development and administration community will grow by approximately 400%. For the first time, Siemens



Healthineers' customers, partners, and employees have "one way of learning" with opportunities to customize their experiences.

Third-party sales and service partners, based on whether an agreement is exclusive or non-exclusive, can be provided with the same confidential sales education content as employees for the products they support, increasing their proficiency and performance while improving Siemens' revenue potential. With more than 200 sales courses available, Siemens can deploy valuable education at the time of a new product launch for all global partners.

Further decreasing time to market, the HILS webinar solution streamlines business processes for four separate areas utilizing four vendors. By leveraging smart APIs, a curriculum can be designed to include webinars, whether competency based, synchronous or asynchronous, in a single integrated solution. This ability provides learner access to review activities within a transcript, business transparency over activities, and increased metadata for stronger analytics for smarter business decisions in the future.

Change Management Efforts

During the two years spent evaluating the healthcare sector's impact on the organization, Siemens AG identified the need to reduce operating redundancies, streamline business practices, and legally separate areas of the organization impacted by the evolution in healthcare laws and practices. This effort required a complete reorganization.

The HoT initiative was formed to create a separate legal entity for healthcare and reorganized it based on best practices into six regions, six global business areas, and multiple global functions. VES has a direct line of contact each group, cultivating new solutions and services that meet the collective needs of the internal and external learners.

Implementing the reorganization presented challenges. VES had to work with other business areas to align content and operating practices to get everyone using one standard for the benefit of the end user, and VES continues to evolve. For example, VES will introduce PEPconnections, a premium subscription to virtual education services to manage a healthcare institutions' performance growth. Such virtual products leverage network knowledge and learning through social adaptation while remaining globally standard and regionally scalable.

With the increasing need for rapid access to information, VES also is developing an image recognition app in attempt to increase simplicity and expedite access to content. Through

a simple scan, learners would be able to retrieve relevant content compatible with multiple devices.

Measurable Benefits

Assessments, surveys, and various feedback mechanisms were designed to touch each of the four levels of Kirkpatrick's evaluation. Each report contains key criteria and helps define:

- **Informal activity.** User access to content confirms learning activities interest learners.
- **Formal level 1, reaction.** For reactions, customer satisfaction surveys focus on content, design, duration, and experience. Each question is rated on a 10-point Likert scale, including net promoter scores.
- **Formal level 2, learning.** Assessment reports on performance by assessment provide different views to each domain, competency and activity. Each report provides insight into knowledge retention and the ability to address issues appropriately.
- **Formal level 3, transfer.** KSA surveys have three forms that can be used to assess knowledge, skill and ability. Each learning activity is aligned to the objectives and elicit information about the applicability to job role, the desired outcome and confidence. The goal is to increase performance, evaluate each criterion-referenced question, and correlate performance with revenue generating activities. The surveys show an increase for all audiences on confidence, satisfaction, and expectations.
- **Formal level 4, results.** Completion reports include details by region and week. Statistics are reviewed and changes correlated with organizational efforts, such as new product launches or large placements. The focus for 2017 was to optimize the experience, incorporate informal activities, and help support performance needs. Since the launch of HILS, there has been a direct correlation between VES activities and these metrics and proven success of performance support and informal activities. The focus on customers ensures that operators are well trained, reducing the cost of field support. A similar focus on employees increased baseline knowledge and performance in the field, saving lives and driving revenue.

Informal Results

- More than 7 million accesses; 3 million completions.
- More than 400,000 PEPconnect accesses since July 2015.
- More than 100,000 sales courses accessed in past two years.

Formal Results

- Customer satisfaction averaged 8.5 (out of 10).
- NPS score of 8.9 (out of 10).
- KSA confidence results of 3.34 (out of 4).
- KSA satisfaction results of 8.43 (out of 10.)
- More than three million eLearning completions in past five years.
- More than 75,000 sales courses completed globally.
- More than 150,000 sales courses accessed globally.

The effectiveness of the educational content is notable as users rated their confidence in their skills at 8 out of 10 after completing online training. A return rate of nearly 70% of users for additional information demonstrates that users rely on PEPconnect to operate their instruments accurately and effectively. Approximately 10% of all PEPconnect users took advantage of the flexible mobile compatibility in completing training. Instant and convenient access to education on mobile devices generated an increase of an additional 10% for course completions.

To measure the business benefits as it relates to the primary goal of reducing support costs, the VES team evaluated the impact of one of Siemens AG key products. Results indicated a 20% reduction in calls to the Technical Solutions Center for the particular product during a year time-frame, resulting in an overall ROI of 1,036%. Support costs were also decreased due to the reduction of time spent on-site by Siemens application specialists. Historically, on-site training time took two to three weeks per instrument with training taking four to five. By utilizing the enterprise solution, application specialists were able to reduce onsite training time by approximately 20%. Although sales figures are not shared by the company, expanding this enterprise solution to sales and service partners is expected to increase overall revenue in markets primarily supported by partners.



Two key examples of cost savings are webinars and training days. The DX webinar strategy previously offered an option of three vendors contracted by each individual area of the organization based on their preferences and events. Each event cost approximately \$3,500-\$5,000 and offered a different experience with no central management. Implementation of HILS integrated webinars provided a centrally managed program with single-source tracking, organizational visibility, and a single-license cost model. The delivery of 100 external webinars cost the business almost \$200,000. Based on historical data, Healthcare may deliver 200 webinars (100 internal, 100 external), equating to \$700,000 in cost savings to the business for less than \$50,000 in licensing fees. Additionally, the content editor tool provides the ability to develop more than 6,000 learning activities internally in seven languages, reducing the cost of course development by 90% for a savings of more than 330 million euro. The translation engine reduced localization costs of translated content by 90%, saving more than \$90 million for ± 1,000 courses in local languages.

HILS and PEPconnect address challenges beyond the typical laboratory setting. For example, a partnership with PEPFAR and CDC expanded the accessibility of laboratory training in sub-Saharan Africa to fight HIV/AIDS. PEPconnect assisted in training more than 140,000 health care workers to deliver HIV and other health services, and the program empowered more than 5,000 laboratory professionals with the tools to fight such diseases. By providing training to strengthen the skills and competencies of lab personnel, PEPconnect will enable 90 percent of people living with HIV to know their HIV status by 2020. As a result of such endeavors, these solutions truly can have a massive impact on a global scale.

Overall

As metrics indicate, HILS delivers the next generation in education innovation, fulfilling the needs of all healthcare learners and evolving with technology and the market for tomorrow and beyond. As a result, customers access information and create new knowledge in ways and at speeds not possible just a few years ago.

The increased accessibility and simplicity of the experience were catalysts to users consuming education at a rate never before seen at Siemens, ultimately improving the quality of patient care. Beyond the access, the learning analytics provide insight into what learners are seeking, helping drive content development and innovations.



With an emphasis on customized education plans, user-generated content, and a holistic virtual learning experience, VES will be introducing future functionality using enhanced metadata while evolving with changes in the technological landscape.

- **PEPconnect app.** The app will utilize image recognition to bring a smarter and faster connection to learners. When the system, modules, or parts/targets are scanned, the app retrieves and organizes relevant content on the screen for the learner to access the needed education and performance support. The image recognition app creates a new approach to learning that will require new roles to facilitate onsite training for customers and new methods to integrate into the learning culture for employees
- **PEPconnections.** The new social profile management and administration features, referred to as PEPconnections, will create a commercial virtual product in the virtual social enterprise. Users will have the ability to assign, track and manage group education, create learning pathways specific to the facilities SOPs, record completion of all learning activities whether offered by Siemens or another source, run reports, manage credit and CEU distribution within a virtual account, and purchase additional subscriptions and educational opportunities.
- **PEPconnect enhancements.** By leveraging metadata and creating a social education profile, users can network with their colleagues and create their own groups of interest to share best practices with like-minded healthcare professionals.

Siemens AG's efforts will revolutionize how people learn in an ever-connected digital world and are the start in the organization's footprint in the web 3.0 space. The efforts include management strategies and are sponsored by the business area's CEO for upcoming product launches.

To increase efficiency in design, development, and deployment for the network for more than 100 developers and administrators, HILS will be optimized in the following areas over the course of the year.

- Enhanced metadata will suggest education content and subscriptions based on profile and activity, providing the ability to view associated objects and target users based on profiles and activities.



- Enhanced dashboard and reporting will provide access to customized data, visual analytics, and more for globally standard and regionally scalable management challenges.
- The organizational readiness competency assessment is a single project with two product outcomes: Sales competency framework to baseline the organization's competencies and create individual learning paths and a new certification program. And automated education planning allows customers to assess their organization needs and populate customized learning plans for their staffs.
- Enhanced classroom management solutions will make TCmanager functionality stronger in HILS and eliminate the need for duplicate LMS functionality.

Ultimately, VES plans to construct a way for users to control their education by allowing them to self-affiliate with groups, view suggested content based on their behavior, and participate in interactive learning that is relevant, collaborative, and effective. Those goals are made possible through the technology available with HILS, which will evolve with new internal tools to create efficiencies, new commercial virtual products to increase revenue, new opportunities for consumer-curated content to extend the reach of knowledge, and new innovations that are not even thought about today.



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