Background Information

SIEMENS
Healthineers

Erlangen, November 25, 2018

RSNA 2018 in Chicago: South Hall, Booth #4136

Digital Ecosystem - an open environment for healthcare stakeholders

- **Around 3500 institutions from nearly 50 countries are already connected to cloud platform.**
- **Cloud-based or locally installable applications are available in the digital marketplace.**

Siemens Healthineers has built a wide presence in daily healthcare provision, with one of the largest sets of healthcare data. From this vantage point, the company took decisive measures to foster the growth of a Digital Ecosystem, an open and secured environment to connect stakeholders, data and applications. It allows healthcare providers to tap into the potential of digitalizing healthcare through fast and easy access to actionable insights. The applications will serve the wide spectrum of clinical, operational, and financial tasks and functions in healthcare delivery. The foundation for seamless connectedness is the cloud platform teamplay[1], that brings together healthcare professionals in a team effort.

Healthcare providers the world over are faced with similar challenges, like growing cost pressure, falling reimbursement rates, and fewer specialist staff, while living up to increasingly high patient expectations. There is a strategy that can unite them all in the pursuit of shared growth: coopetition.

Coopetition boosts value creation for all

Interaction between coopetitive companies is characterized by a partial congruence of interests – they cooperate in order to boost value creation for all. Applied to healthcare, this is an especially powerful concept: Every day, vast amounts of health-related data are generated in the form of images, laboratory results, pathological findings, reports, and so on. However, as long as the data is not interpreted or shared, it is mostly useless. To enable smart use of health-related data, Siemens Healthineers has created an open and secured

environment for a wide range of healthcare stakeholders. They can use a range of applications from Siemens Healthineers and numerous other partners to get the most out of shared healthcare data. This Digital Ecosystem is not a product, but a concept – designed to promote innovation and collaboration along the entire healthcare supply chain. As in a natural ecosystem, participants interact and grow together. The insights they gain from their own data are complemented by additional findings flowing from the combined data pool of all the participants in the platform.

Many of today's healthcare challenges can be overcome
If this ecosystem grows and flourishes, it will enable healthcare providers worldwide to harness the full power of a digital healthcare system: It can help benchmark performance, guide diagnosis, make treatment more precise, establish best practices faster – and much more. For example by connecting their imaging equipment to a single global, cloud-based network, providers are able to view near real-time utilization data, monitor patient radiation doses, or share imaging protocols. Or even predict therapy response: Resistance to conventional radiation therapy is a major issue in the treatment of late-stage lung cancer, leading to relapse. The heterogeneity of tumors makes it difficult to personalize therapy. One approach to improving the accuracy of lung cancer diagnosis to personalize therapy is using predictive analytics and noninvasive imaging in conjunction with AI-powered decision-support tools and quantitative genomics to predict therapy response.

This strategy relies on information from a wide range of different sources. "Siemens Healthineers imaging equipment, in vitro solutions, and associated software and services globally cover more than 240,000 patients per hour. Healthcare providers stand to benefit immensely from combining the resulting information within an ecosystem: Instead of relying on insights gained from 500 cases, this would allow them to draw on millions," explains Alexander Lippert, Head of Siemens Healthineers Digital Ecosystem. "Since the introduction of our first cloud-based offerings, we have created an environment in which users leverage the insights of close to 40 million clinical dose and utilization studies from operating imaging equipment," Alexander Lippert adds.

How can healthcare providers access specific applications?

A dedicated digital marketplace allows users to search for applications or to request a quotation or trial. Offerings available will include both cloud-based and locally installed deployments (on-premise applications). With the locally installed syngo.via[2] OpenApps, intelligent imaging software for multi-modality reading from Siemens Healthineers and partners is provided. The applications are available through the digital marketplace and easily installed with only one click, fitting seamlessly into the clinical workflow. The digital marketplace enables the user to browse, download and try out applications as well as to request quotations in line with a flexible subscription concept. With syngo.via OpenApps Siemens Healthineers provides direct and open access to an ever-growing variety of clinical applications.

Next will be Cios OpenApps for mobile C-arms to help improve the workflow in the OR in the future. Already the new systems, like for example Cios Spin will provide these functions. Without investing in additional hardware, users shall be able to select and download applications directly from the store. After downloading, the application will immediately be available on the mobile C-arm.

In addition to the clinical, operational or financial benefits of each application, cloud deployment provides distinct digital cloud values such as being easily scalable, cost effective and future-proof, and removing data silos.

Teamplay is the foundation for Siemens Healthineers and its partners cloud applications. Teamplay has been recognized for its handling of data privacy[3] and is already in use at hundreds of customer sites. Applications for imaging performance management for example connect data from imaging devices and radiology/cardiology information systems. Teamplay apps provide its' members insights to make prompt and well-informed decisions based on an intelligible overview of performance data. It monitors quantities such as imaging throughput or dose levels, utilization of staff, rooms and resources of the whole department down to every device and procedure, simplifying reporting and showing where workflows need adjustments.

Network of innovative services and applications

Siemens Healthineers aims to help healthcare providers with faster and easier access to innovative digital health services and applications. This is why Siemens Healthineers is not only providing proprietary solutions and applications itself, but is also inviting solutions, data and platform-partners to join. Currently 19 partners[4] are participating with applications that cover different areas as:

Neurology	Combinostics, Cercare Medical, Endovantage, Prism Clinical Imaging, SyntheticMR
Cardiovascular	Arterys, Circle Cardiovascular Imaging, HeartFlow, Pie Medical Imaging
Lab Diagnostics	XIFIN
Education and Training	Thieme Group
Research	AMRA Medical
Optimizing clinical operations	Cranberry Peak, ExplOrer Surgical, mediCAD Hectec, Precision Image Analysis (PIA), Materialise, Mint Medical, Stroll Health

The offerings within the Siemens Healthineers Digital Ecosystem are continuously developing and growing, establishing new options for healthcare providers across the globe to efficiently introduce digital health offerings into their institution. Best of all: Customers and patients benefit from an ever-expanding range of medical applications.

In advance of this year's RSNA, Siemens Healthineers is promoting post-processing applications from AMRA, Combinostics, Arterys and HeartFlow. Customers can subscribe to these applications for up to one year including a fixed number of studies. In the case of Arterys, even an unlimited number of studies can be post-processed.

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[1]teamplay is not commercially available in all countries. If the services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed.

[2]Syngo.via can be used as a standalone device or together with a variety of Syngo.via-based software options, which are medical devices in their own rights. Syngo.via and the Syngo.via based software options are pending in some countries the necessary clearances and thus are not available for sales in all countries.

[3]teamplay – CORE applications: teamplay Dose, teamplay Usage and teamplay Protocols – has been awarded with the European Privacy Seal and the German "Seal of Privacy for IT products" of the Independent Centre for Privacy Protection in Schleswig-Holstein (ULD).

[4]Siemens Healthineers is neither the provider nor reseller nor legal manufacturer of the 3rd party applications in Siemens Healthineers Store. Any claims made for 3rd party applications as well as the content and all warranty obligations are the sole responsibility of the legal manufacturer and not Siemens Healthineers. The product names and/or brands referred to are the

property of their respective trademark holders. Additionally, the 3rd party applications mentioned may not be commercially available in all countries. Due to regulatory reasons its future availability cannot be guaranteed. Please contact your Siemens Healthineers representative or 3rd party application team for more information and further details about the product and its availability in your country.

For further information on Siemens Healthineers Digital Ecosystem see

www.healthcare.siemens.com/infrastructure-it/digital-ecosystem.

For further information on teamplay see

www.healthcare.siemens.com/infrastructure-it/digital-ecosystem/teamplay.

For further information on RSNA, please see siemens-healthineers.com/press-rsna.

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Siemens Healthineers enables healthcare providers worldwide to increase value by empowering them on their journey towards expanding precision medicine, transforming care delivery, improving patient experience and digitalizing healthcare. A leader in medical technology, Siemens Healthineers is constantly innovating its portfolio of products and services in its core areas of diagnostic and therapeutic imaging and in laboratory diagnostics and molecular medicine. Siemens Healthineers is also actively developing its digital health services and enterprise services. In fiscal 2018, which ended on September 30, 2018, Siemens Healthineers generated revenue of €13.4 billion and adjusted profit of €2.3 billion and has about 50,000 employees worldwide. Further information is available at www.siemens-healthineers.com.