There is **Spirit** in everyone, but it needs to be free !

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An overview on Standards-Based (IHE) Interoperability for the IoT & Industry 4.0

Author: **Tiani Spirit Team**

Vienna, 2017

- **Tiani Spirit**
  - 2004 member of several IHE committees
  -     (PCC, IT-Infrastrucutre, e.g.)
  - epSOS (European Patients – Smart open Services) since 2008
  - 2011 Oasis Membership
  - Contribution to the Security Framework US
  - Contribution to eSENS

- **Martin Tiani**
  - contribution to the Austrian Stadardization Working Group
  - contribution to IHE since 2001
  - epSOS – contribution for global architecture since 2007
  - contribution to the eHealth initiative for the european community roadmap
  - 2017 launching Grapevine

IHE: Integrating the Healthcare Enterprise
What It Is & How It Works
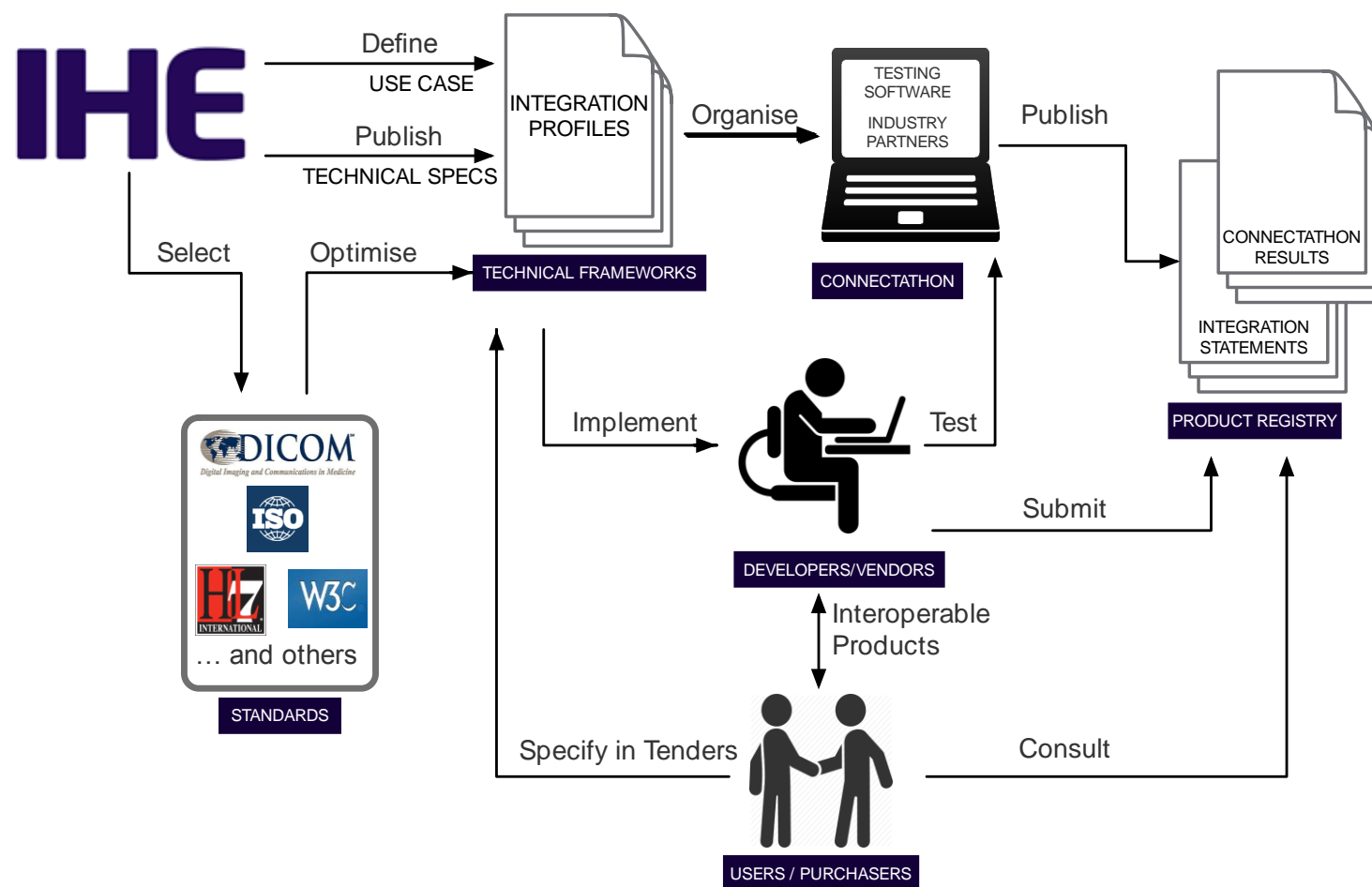
- IHE formalises the exchange of health information
- clinical and technical experts define critical use cases for information exchange
- technical experts create detailed "profiles" for communication among systems to address use cases, selecting and optimizing established standards
- vendors implement these profiles in healthcare IT systems
- vendors test their systems under IHE guidance at carefully planned and supervised "connectathons"
- 400+ healthcare-related organizations worldwide
- 20 national/regional deployment committees oversee testing activities around the globe

Customer Benefits of Interoperability

IHE Conform	Non-IHE Conform
+ Test twice per year at Connectathon (US, Europe, Australia, Japan)	− Test has to be done by each vendor (HIS) and client again.
+ No risk, faster and cheaper for client	− Testing takes a lot of time
	− High costs

Interoperability for Health IT Systems

IHE Conform
easy to replace
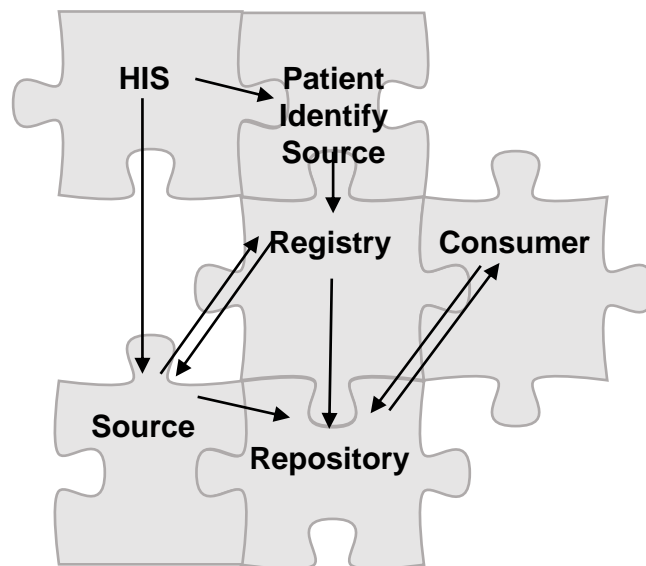
Non-IHE Conform
high cost & effort to replace
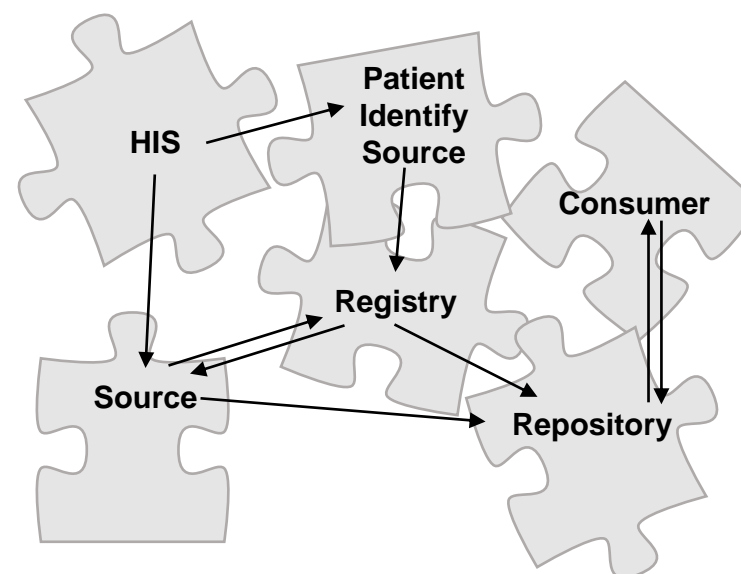
Costs for Interoperability

Time / Cost

	IHE Conform	Non-IHE Conform

Analyse

Design

Implementation

Test
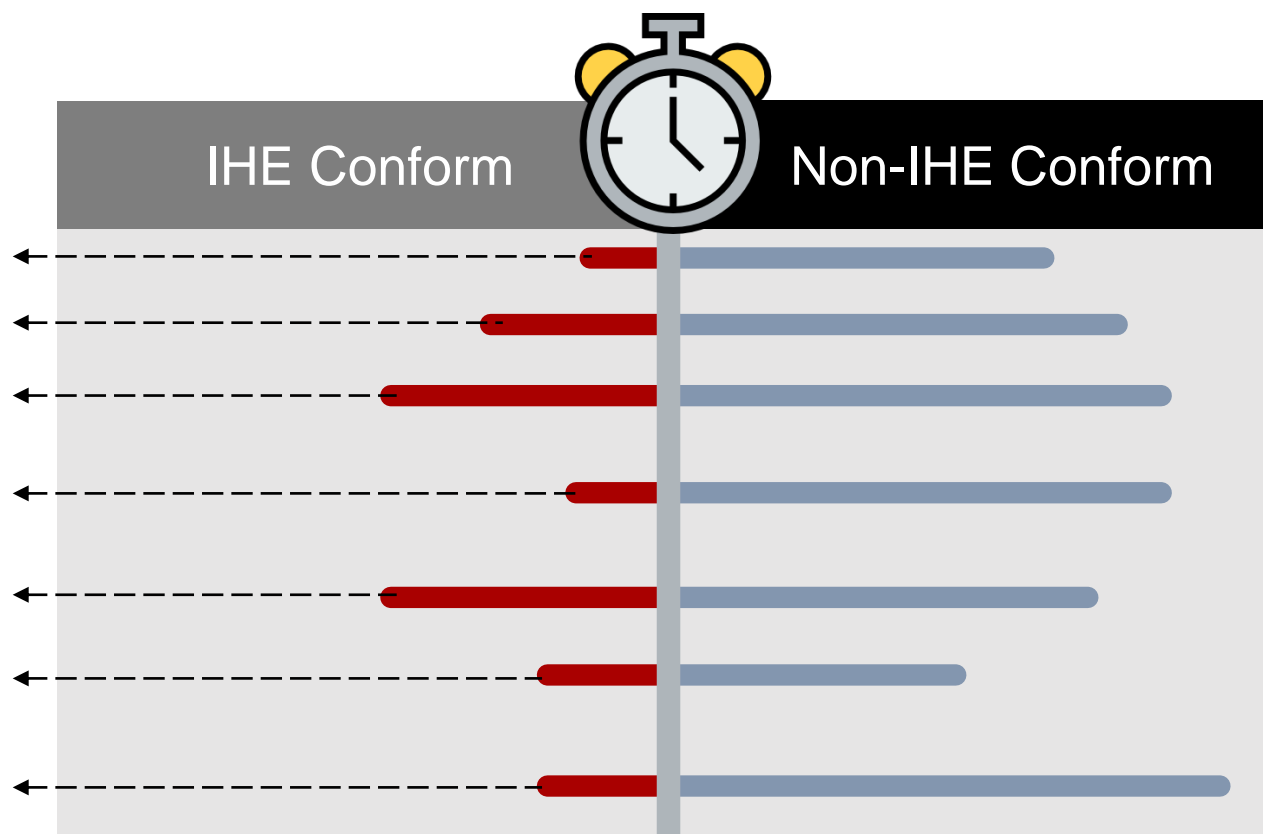*(each years 2 times by Connectathon - no risk for client)*

Total Costs

Costs Specification
(done by IHE community)

Interfaces between Vendors
(standard interfaces)

Gartner: 54% of IT-Budget is used for Interoperability!

Official Journal of the European Union

COMMISSION DECISION (EU) 2015/1302

of 28 July 2015

on the identification of 'Integrating the Healthcare Enterprise' profiles for referencing in public procurement

(Text with EEA relevance)

…. http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32015D1302&from=EN …

Done at Brussels, 28 July 2015.

For the Commission
The President
Jean-Claude JUNCKER

- The completion of the Digital Single Market is a key priority for the European Union (Europe 2020)!
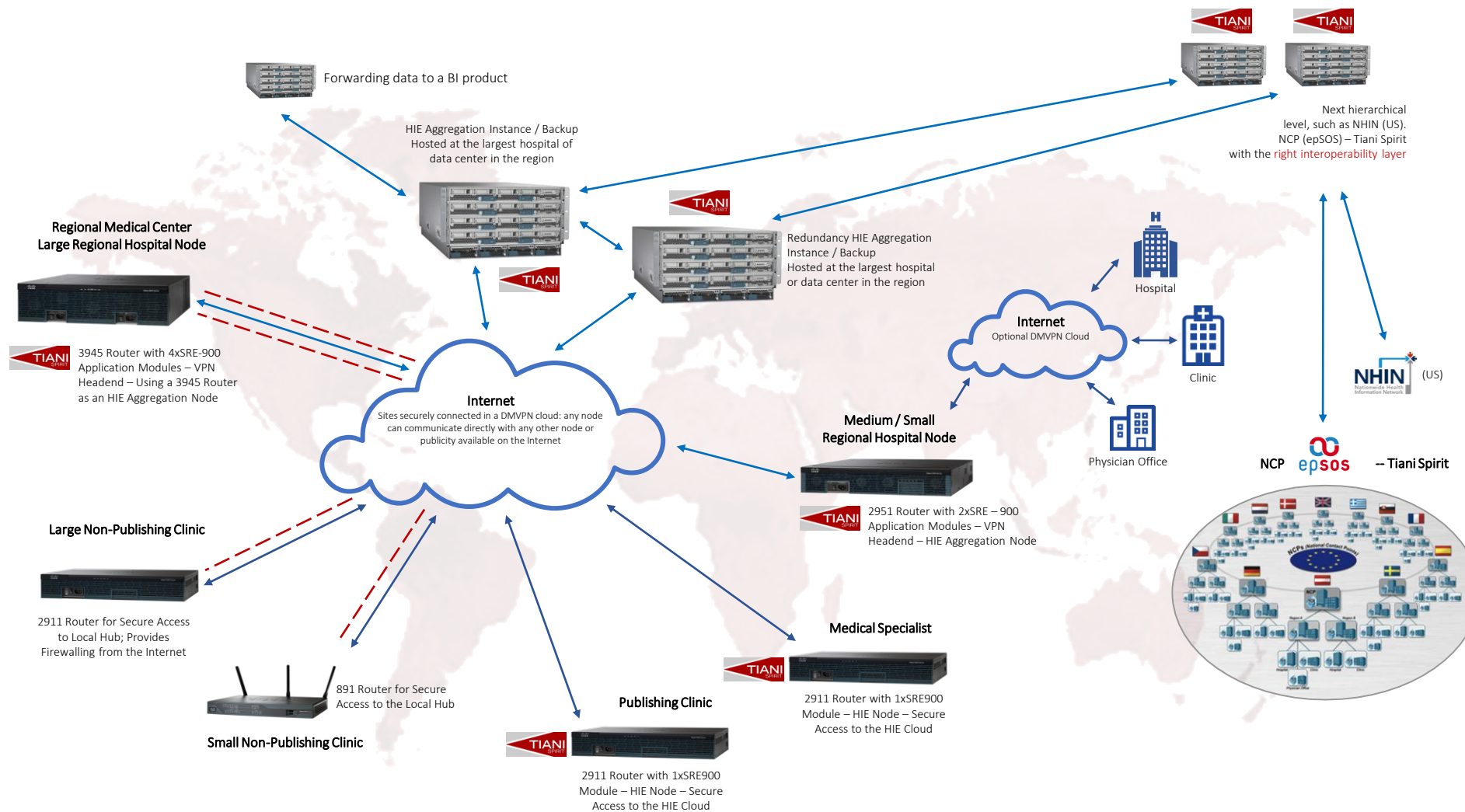
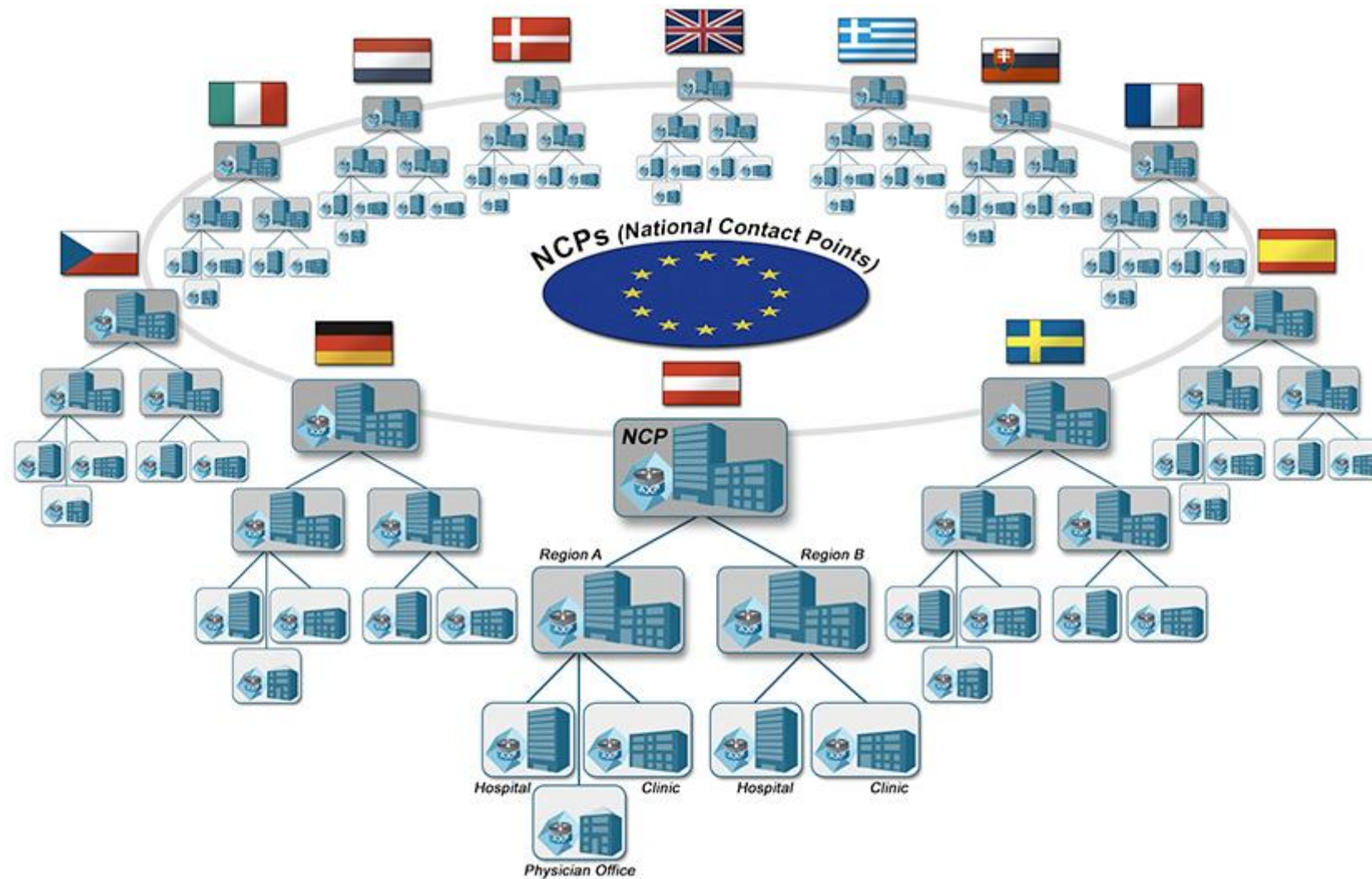**After 15 years IHE is well established!!!**

Forwarding data to a BI product

Next hierarchical
level, such as NHIN (US).
NCP (epSOS) – Tiani Spirit
with the right interoperability layer

HIE Aggregation Instance / Backup
Hosted at the largest hospital of
data center in the region

Regional Medical Center
Large Regional Hospital Node

Redundancy HIE Aggregation
Instance / Backup
Hosted at the largest hospital
or data center in the region

Hospital

Internet
Optional DMVPN Cloud

3945 Router with 4xSRE-900
Application Modules – VPN
Headend – Using a 3945 Router
as an HIE Aggregation Node

Clinic

Internet
Sites securely connected in a DMVPN cloud: any node
can communicate directly with any other node or
publicity available on the Internet

Medium / Small
Regional Hospital Node

Physician Office

NCP   epsos   -- Tiani Spirit

NHIN (US)

Large Non-Publishing Clinic

2951 Router with 2xSRE – 900
Application Modules – VPN
Headend – HIE Aggregation Node

2911 Router for Secure Access
to Local Hub; Provides
Firewalling from the Internet

Medical Specialist

891 Router for Secure
Access to the Local Hub

Publishing Clinic

2911 Router with 1xSRE900
Module – HIE Node – Secure
Access to the HIE Cloud

Small Non-Publishing Clinic

2911 Router with 1xSRE900
Module – HIE Node – Secure
Access to the HIE Cloud

NCPs (National Contact Points)

NCP

Region A

Region B

Hospital

Clinic

Hospital

Clinic

Physician Office

IHE

Various infrastructure model but C O M M O N needs

- users need to be authenticated
- subjects need to be identified
- secured Information delivery needs to guarantee confidentiality, integrity and availability

SP CS *making business easier.eu*

PEPPOL PAN-EUROPEAN PUBLIC PROCUREMENT ONLINE *making procurement better.eu*

e CODEX *making justice faster.eu*

epsos EUROPEAN PATIENTS SMART OPEN SERVICES *making healthcare better.eu*

STORK2.0 SECURE IDENTITY ACROSS BORDERS LINKED 2.0 *making access smarter.eu*

Business setup

Procurement

E-Justice

eHealth

eID

EU Initiative e-Sens - IHE

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Goal

◄ to improve the **cross-border access** of citizens and business to **public services in Europe** by provision of **interoperable IT solutions**

◄ PA and agencies from 20 countries

◄ Re-using existing solutions

◄ Domains Involved:

◄ eProcurement

◄ eHealth

◄ eJustice

◄ Business Lifecycle

◄ Maritime Affairs

◄ eAgriculture

WP1: Project Management
(General Coordination, Administrative Management & Advocacy)

WP2: Communication and Marketing

WP3: Sustainability and Long-Term Governance

WP4: Project Legal Expertise Centre

5.1: e-Procurement

5.2: e-Health

5.3: e-Justice

5.4: Business Lifecycle

5.5: New domain 1

Common!
One standard layer will be chosen

WP6: Building blocks Provision

6.1: e-Delivery & e-Interaction

6.2: Semantics, Processes & Documents

6.3: Identity, security and Trust

6.4: Conformance & Tests

6.5: System Engineering & Provision

- TCP/IP since ~35 years (Network Layer - Routing, Switching, UCS)

- IHE since ~15 years (Application Layer - Internet of Things, Industry 4.0, ...)
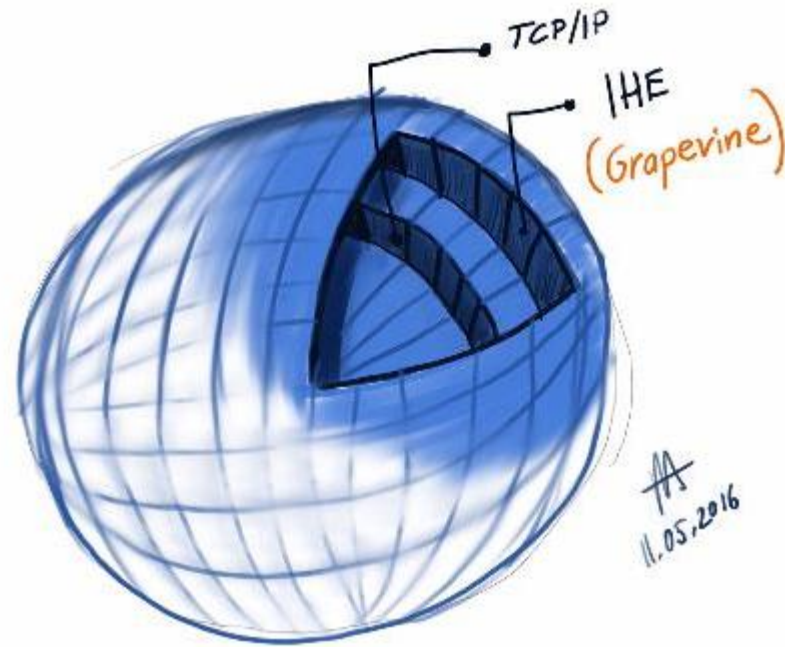
It's a "Déjà vu" for CISCO and the ICT & Telecom industry!

Experimental Prototype Community of Tomorrow

Grapevine is an initiative inspired by Walt Disney's vision dating from before 1965.

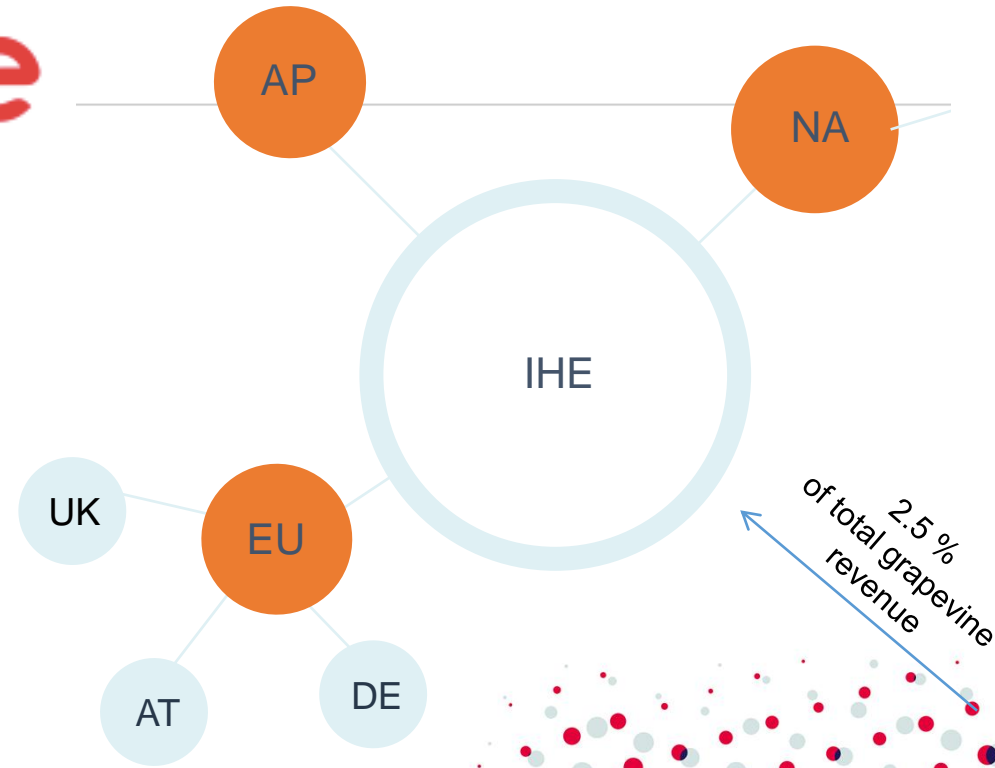Disney's dream was to build up tomorrow land, which is well known under the name EPCOT, located in Disney World Florida.

A part of this vision was to build up a paperless hospital. This hospital called Celebration Health is one of the biggest hospitals in Florida.
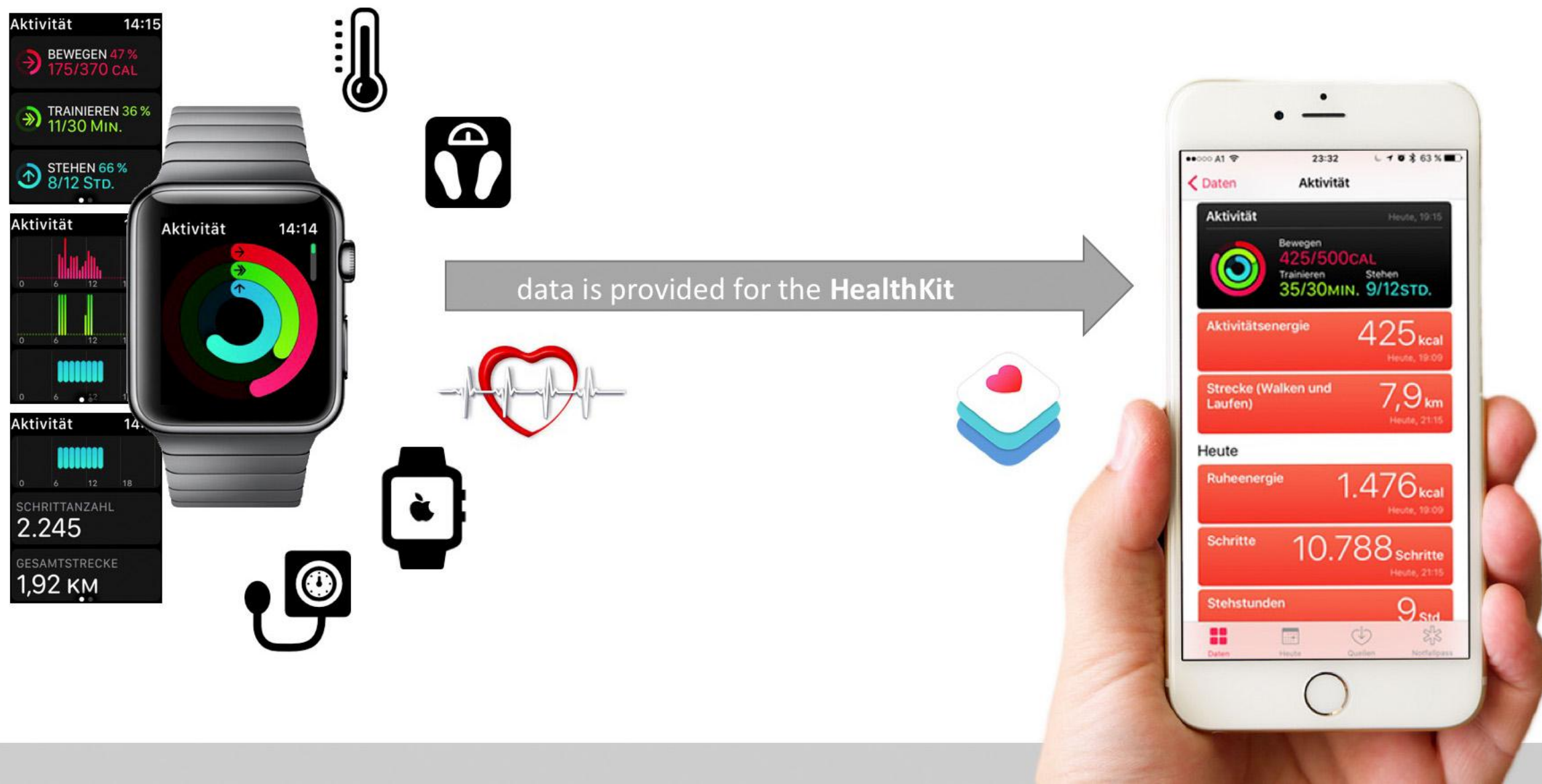
www.grapevineworld.com
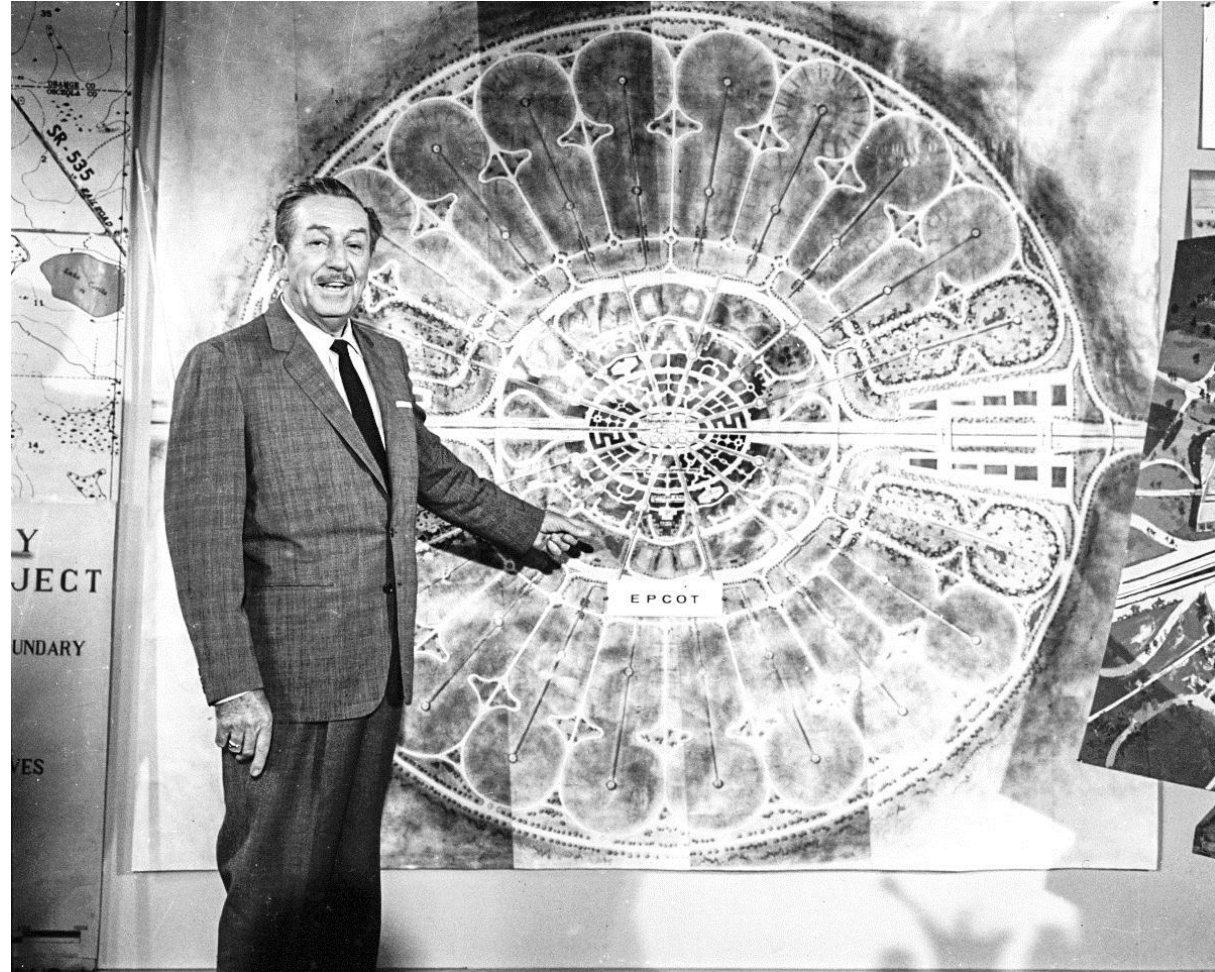
Grapevine & IHE

grapevine will be **THE marketplace for all IHE related manufacturers, providers and system integrators and will become THE backbone for international data exchange.** Furthermore, grapevine will be strengthening and leveraging the IHE activities that already demonstrated great success and will be a sustainable funding channel for further IHE activities.

grapevine stands for interoperability which is **the key driver for all further global activities** such as IoT, Industry 4.0, ...
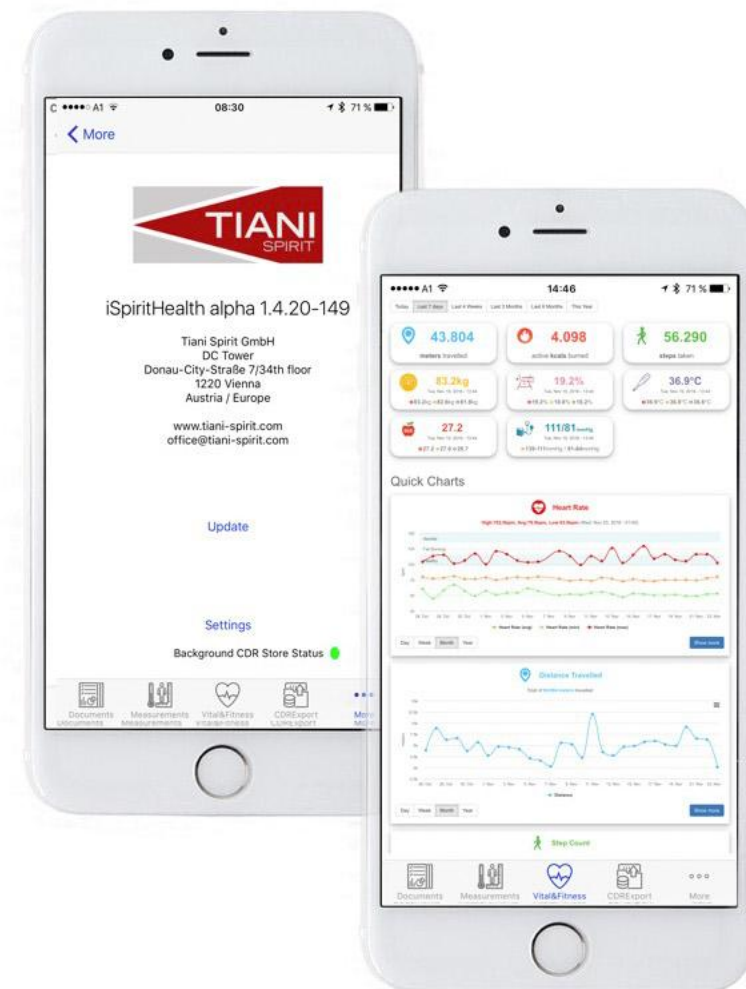
AP

NA

IHE

UK

EU

AT

DE
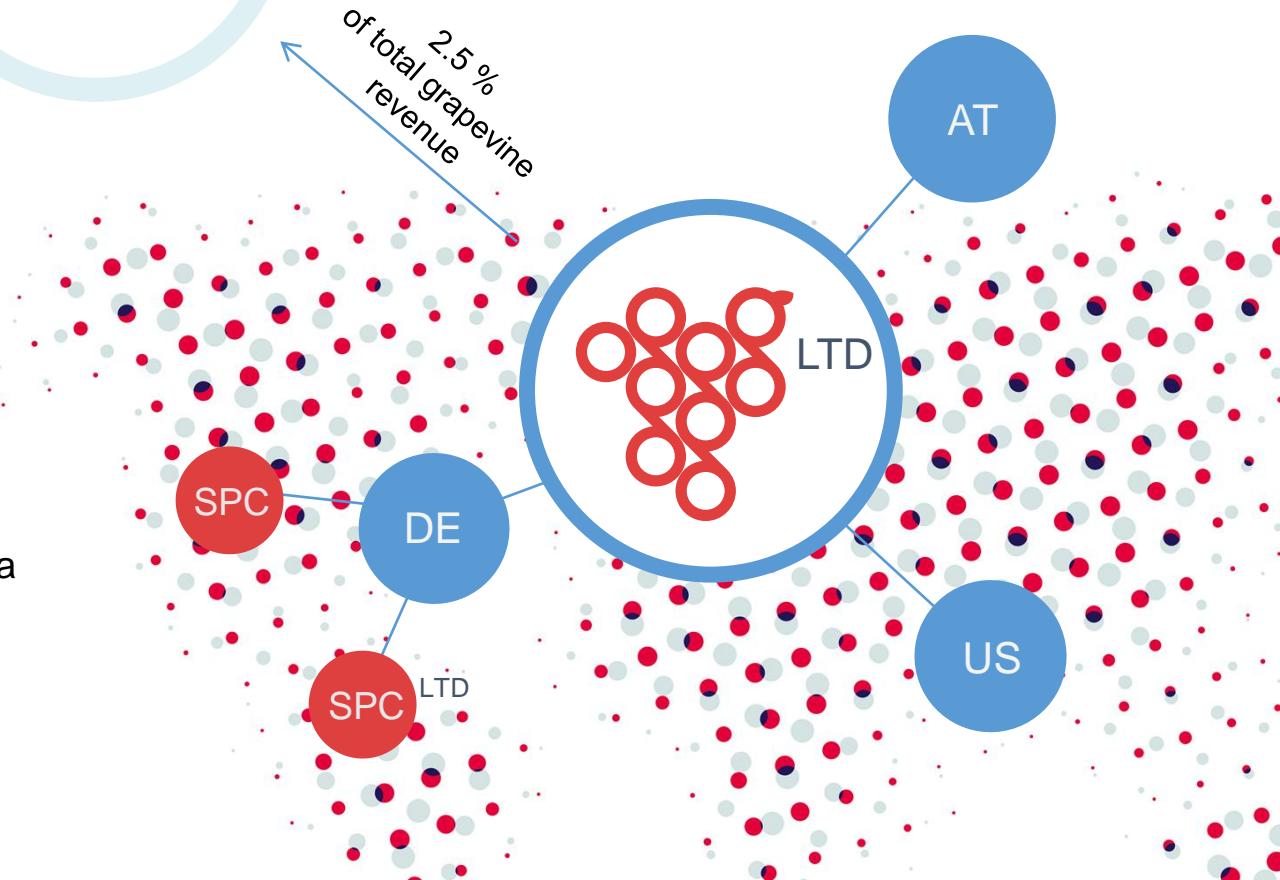
2.5 % of total grapevine revenue

AT

LTD

SPC

DE

US

SPC LTD

iSpiritHealth provides patient's Apple HealthKit information to physicians

data is delivered to physicians

TianiSpirit EHR – AppleHK Integration

- Provides EHR data (CDA/FHIR) directly to the patient's IOS AppleHK

There is **Spirit** in everyone, but it needs to be free !

Thank you for your attention !

Author: **Tiani Spirit Team**

Vienna, 2017