

Visitors Programme of the Federal Republic of Germany Information Tour „Industry 4.0 - The digitalization of the economy“

Berlin, Munich, 06.-12.8.2017

- fact-finding tour
- a first hand impression of the journey's topic itself and of Germany and its people
- meeting with experts and exchange with participants from different countries
- visits to different institutions and organisations of relevance to the field
- cultural programme

A person is silhouetted against a vast, starry night sky. The Milky Way galaxy is visible, stretching across the frame with a vibrant pink and purple glow. The person stands on a dark, rocky outcrop, looking up at the stars. The overall scene is serene and awe-inspiring, symbolizing the vastness of the universe and the journey of discovery.

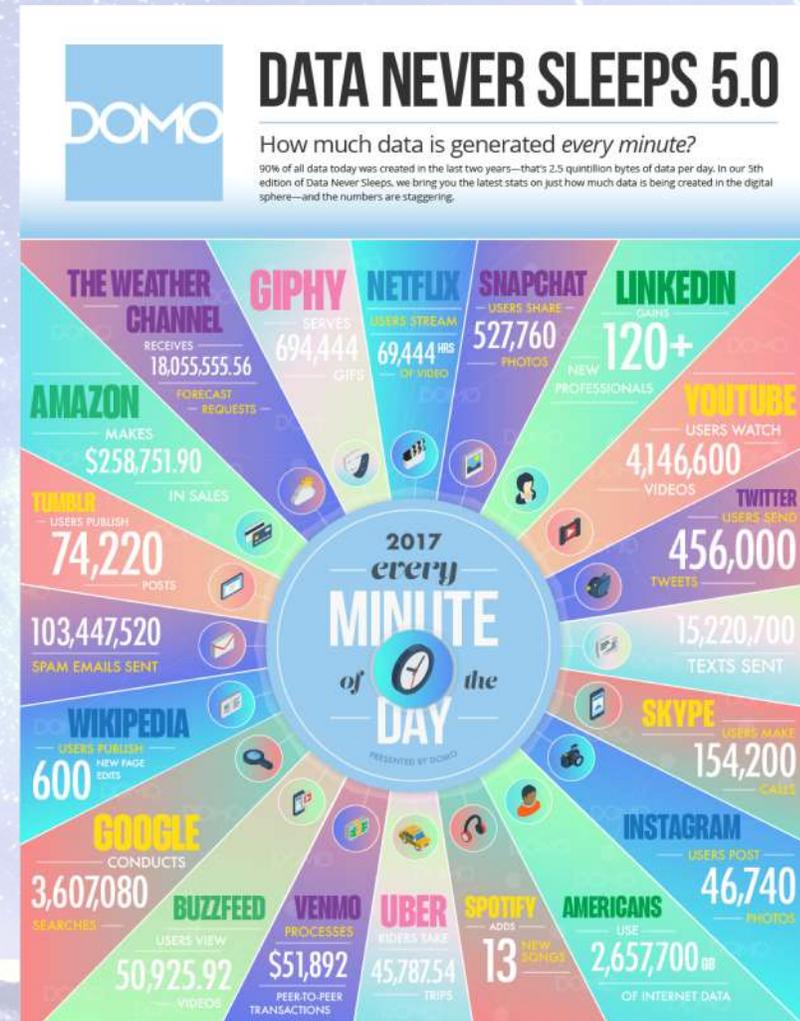
Semantic Hub provides the experts
of pharmaceutical companies
with “reality check” on patient journey
based on millions of real patient stories

Pharmaceutical companies are always interested in getting to know their “real patient”. However, it’s a hard task

- In Clinical Trials, pharmaceutical companies often work with **“ideal” patients**. So, they experience the lack of knowledge on their **real patients**, especially for complex, multifactorial diseases
- Collecting Real World Evidence (RWE) from Electronic Health Records is not always possible
- Offline methods (such as focus groups, interviews) are often **subject to bias** – due to small samples, socially desirable responding and impossibility to foresee questions aimed at gathering unexpected insights
- Meanwhile, patients, their caregivers and doctors generate **huge amounts of RWE data** in the Internet every minute

Digitalization opens new windows of opportunities. The only problem is to select the right tool in order to see your “right patient”

- Unfortunately, most of the existing tools aimed at analyzing social networks, forums, patients blogs, etc. have a very limited functionality, such as tracking mentions of a brand, sentiment analysis and extracting adverse events
- **Deep semantic analysis of natural language texts** is needed to provide a brand new digital paradigm of extracting medical and marketing insights on patient journey



Semantic Hub provides a totally new paradigm for gathering knowledge on patient journey and intelligent stratification of patients

Semantic Hub provides:

- **Broad coverage of information:** millions of real stories for each indication (e.g. Diabetes by type) based on posts of patients, their caregivers and doctors
- **Comprehensive analysis** based on text mining and natural language understanding (500+ semantic categories for each case)
- **Unbiased results, unexpected insights...**

Semantic Hub extracts knowledge from the millions of user posts (patient forums, QA sites, professional social networks for doctors, etc.) and gathers unbiased data on how patient archetypes look like. It includes knowledge on the patient's life cycle in terms of experienced symptoms / triggers for diagnostics, relations with HCP, values, expectations and emotional aspects, unmet needs, awareness and opinions (incl. myths), digital sources patients believe, drivers and barriers in choosing a treatment, and so on – which can be used as a source of unexpected medical insights.

Natural Language Processor of Semantic Hub extracts every important piece of information from each patient's story

Well **this has escalated quickly!** Now diagnosed as **type 2** and starting **metformin** today!

Discussion in '[Newly Diagnosed](#)' started by [Steviechurch74](#), Apr 10, 2018.

I've been feeling ill for months and getting worse. Extremely thirsty blurred vision, frequent urination, feeling hung over & dizzy etc... feeling sick barely able to drink anything other than water and an occasional cup of tea. About a month ago was told I was borderline with HbA1c of 46 having had an earlier reading of 48. After this I have really behaved myself and not eaten a takeaway or had any fizzy pop or beer for over a month... I've eaten healthy fresh cooked meals cutting carbs and switching to wholewheat bread, pasta & brown rice. I've lost 1 stone 4 pounds. Despite this I've felt worse than ever and barely able to keep awake and now back at HbA1c 48 and feeling truly shocking. I'm now diagnosed as **Type 2** and starting **metformin** and am waiting for the results of a **GAD test**. **Am I going to get worse and need insulin?**

Diagnoses mentioned by the patient (wording can be important)

Time aspects in patient journey

Symptoms mentioned by the patient (wording is important)

Diagnostics procedures mentioned by the patient (wording is important)

Mentioned biomarkers and their values

Patient feels worsening

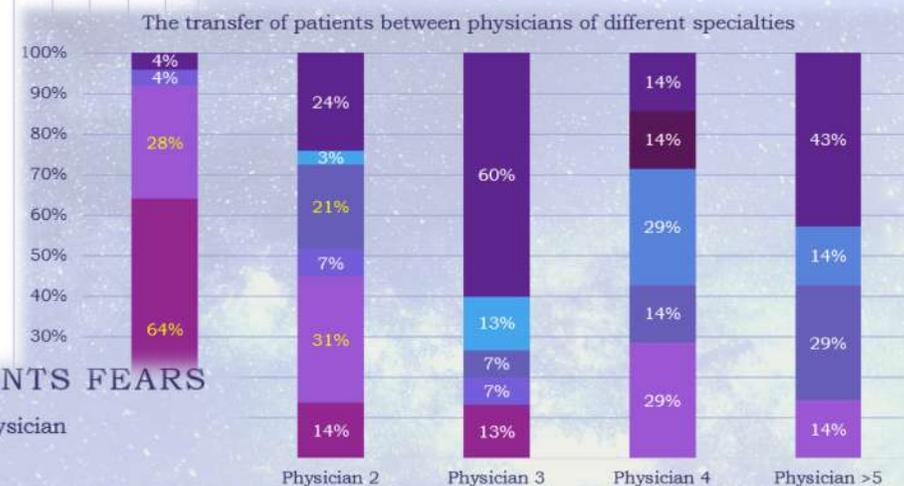
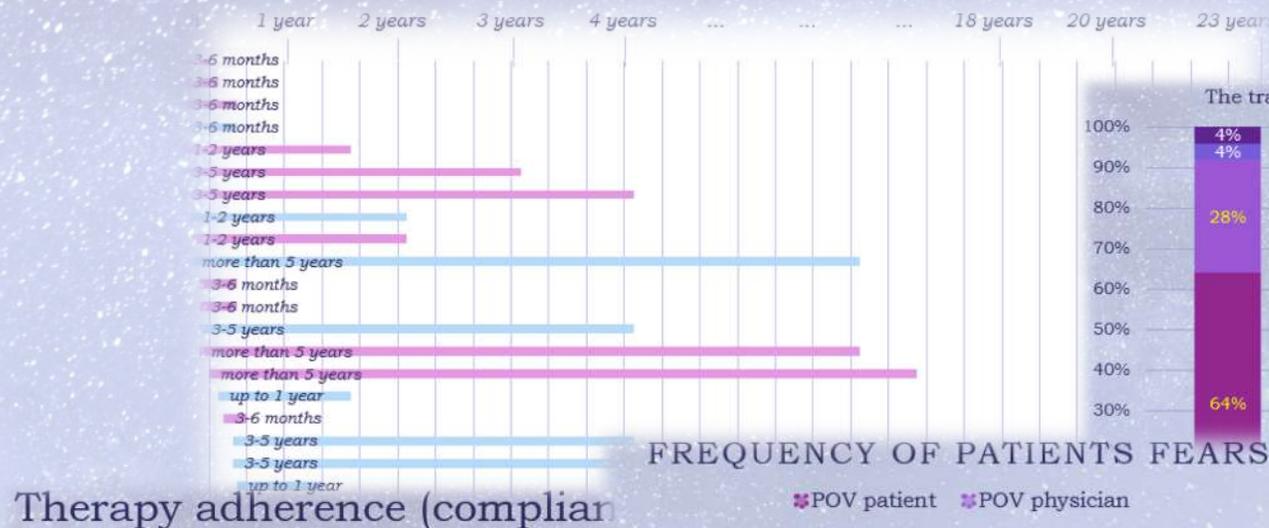
Patient feels mixed-up or shocked

Names of drugs (chemicals) or drug types mentioned by the patient

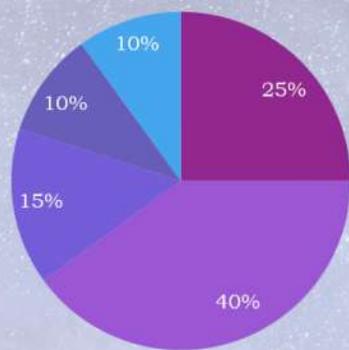
Patient is mentioning / asking about diet

Patient is afraid of getting worse and is asking for forecast

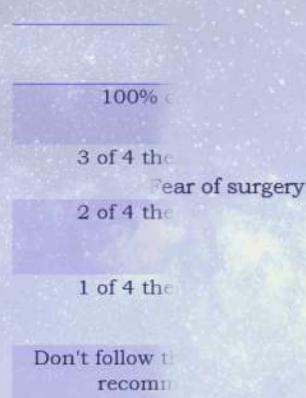
Then, thousands of stories are pulled together to build patient archetypes and to form timelines of their journeys. Data can be compared with insights from other sources



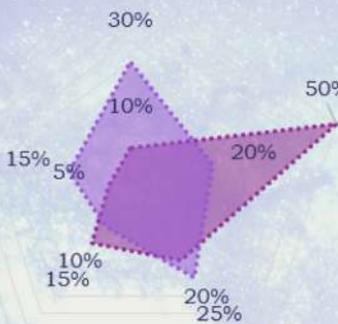
Therapy adherence (compliance)



- 100% compliance
- 3 of 4 therapy steps
- 2 of 4 therapy steps
- 1 of 4 therapy steps
- Don't follow the doctor's recommendations

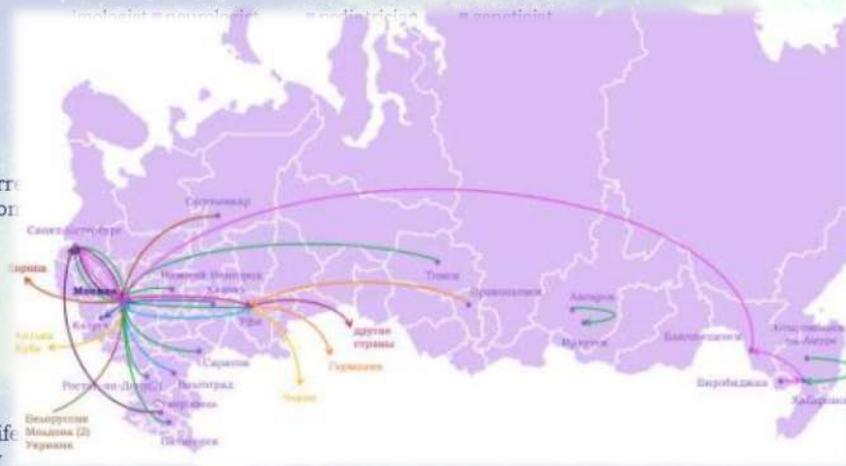


Negative forecast

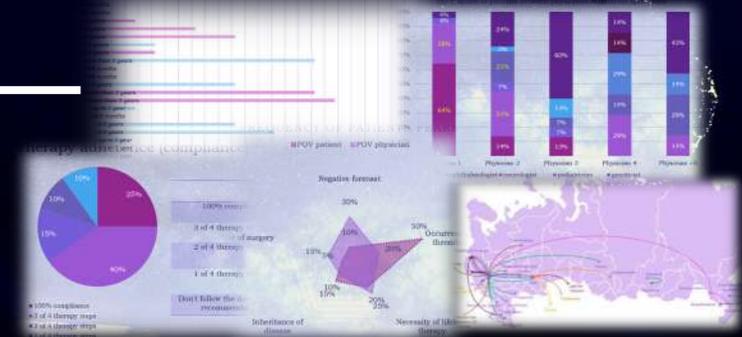
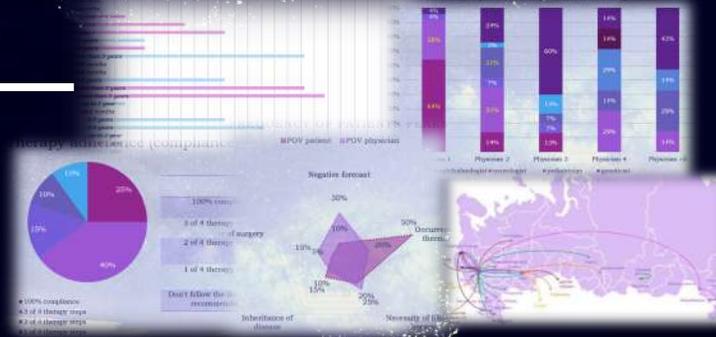
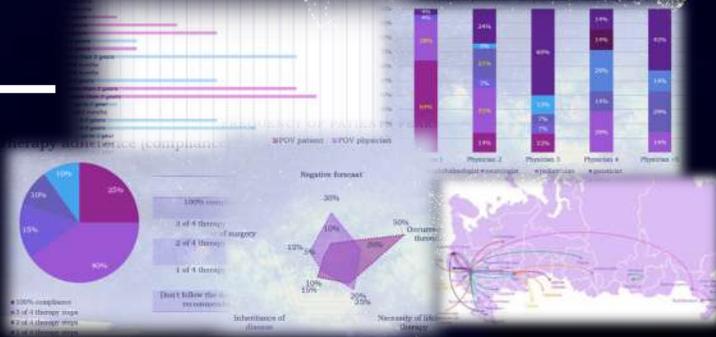


Inheritance of disease

Necessity of life therapy



The analysis can be carried out for various countries and regions



Semantic Hub supports critical decisions during several stages of a drug life cycle

Other Semantic Hub solutions provide pharmaceutical companies with the following possibilities:

- **Identification of patients with orphan diseases.** For orphan and rare diseases, Semantic Hub provides full scale screening of the Internet and identifies patients to form the “funnel” for further analysis. It provides deep scanning of patient stories in patient forums, groups in social networks, health-related QA portals, etc. It builds the picture of their **journey through the local healthcare system from the manifestation of disease to diagnosis**, and afterwards. **The solution brings the most benefit during a prelaunch stage**
- **After a launch**, Semantic Hub identifies already diagnosed, as well as underdiagnosed, patients in the Internet and / or other information sources. It screens and extracts stories of patients potentially having a disease to form the **funnel of leads for further diagnostics and treatment**. Such screening supports **early detection** of the disease, which is critical both in terms of efficacy for patients and the image of a company
- **To support the leadership of your portfolio**, Semantic Hub selects the promising assets (or the threats to your products) out of the universe of drug candidates and qualifies them according to a variety of success and risk factors. It doesn't replace experts, but enables them to get rid of routine work and to focus on the most intelligent tasks

The detailed description of each solution can be provided by request.

What is unique about Semantic Hub?

- **Not just data, but the support of your decisions.** The results are provided to our Customers with actionable (sometimes unexpected!) insights. The results are represented in a form of a report with infographics or as an interactive portal
- **AI which works in synergy with your experts.** We use AI and deep understanding of natural language. We have implanted expert knowledge from the industry into our software – not to replace your experts, but to help them focus on the most intelligent / critical activities. We focus on Pharma as our one and only industry and have a huge expertise there
- **Interactive design and subscription model.** Our approach is very flexible, so the Customer can generate and check new hypotheses during the research. After the project is implemented, there is a subscription for regular updates, so gathering fresh data e. g. twice a year requires almost no effort from the Customer
- **Security issues – checked and approved** by HQs of multinational pharmaceutical companies. Software is deployed on servers in **Germany**

Some Customers:



NOVARTIS

AMGEN

AstraZeneca 

 SANOFI GENZYME



50+
successful
projects



EXPERIENCE

100+ years in

NLP

AI

DECISION
SUPPORT SYSTEMS

Semantic Hub Team



THOMSON REUTERS

Yandex

SANOFI



NOVARTIS



Bristol-Myers Squibb



NATIONAL RESEARCH
UNIVERSITY



Dorodnicyn Computing Centre of RAS



ADVISORY BOARD

Top-level experts from
Pharma



20+ team
members

A person is silhouetted against a dark night sky, standing on a small rock or ledge. The sky is filled with stars, and the Milky Way galaxy is visible as a bright, hazy band of light stretching across the upper portion of the frame. The overall scene is serene and contemplative.

Thank you!

www.semantic-hub.com