


Applying AI in children's medical environment

Business Analytics-Day 2020
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Mathematical modelling
Knowledge Graph
Machine Learning
Data Integration



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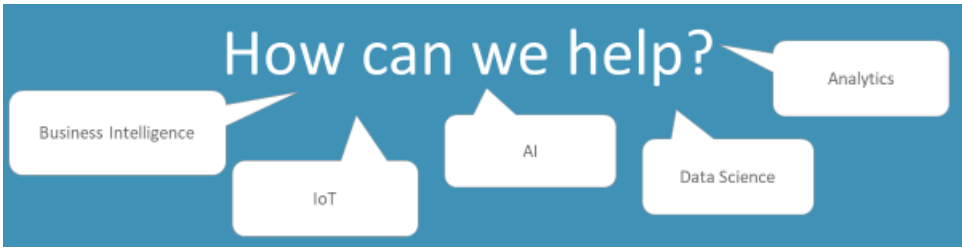
Imagine a children's house

18 children with no or very limited opportunities	120 nursing staff
<ul style="list-style-type: none"> to move or walk independently to express needs to breathe independently 	<ul style="list-style-type: none"> from 16 nations take care of children 24x7 not enough time for proper documentation with very stressful processes and tasks

CHALLENGES ?

Unrest	Communication	Staff shortage
Medical Care	Languages	Time
Medication	...	

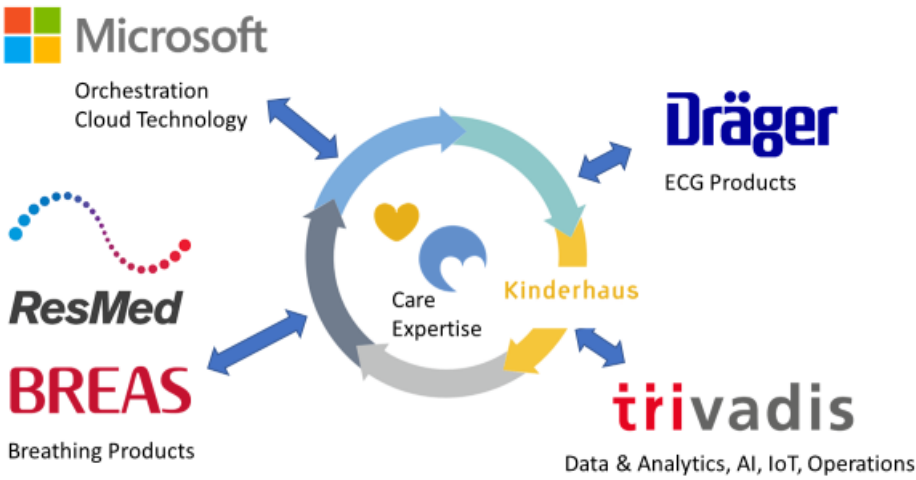




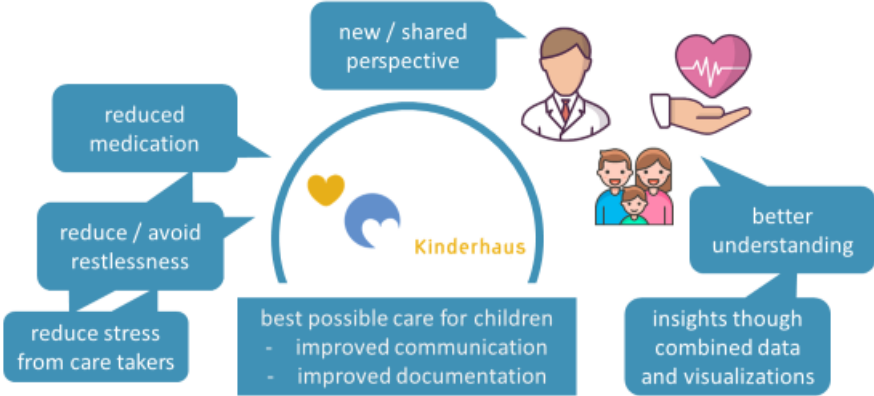
How to solve problems in such a complex environment

...

with an interdisciplinary Partner Network



How to help based on our skills? trivadis



Data?

Data Landscape trivadis



Medications / Treatment



Breathing / ECG

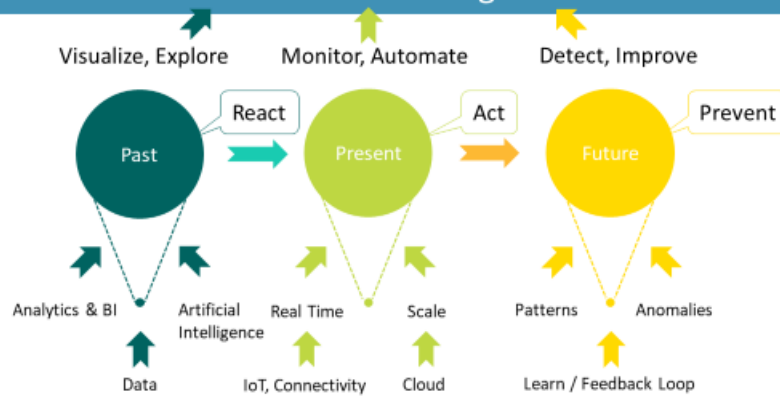


Child / State

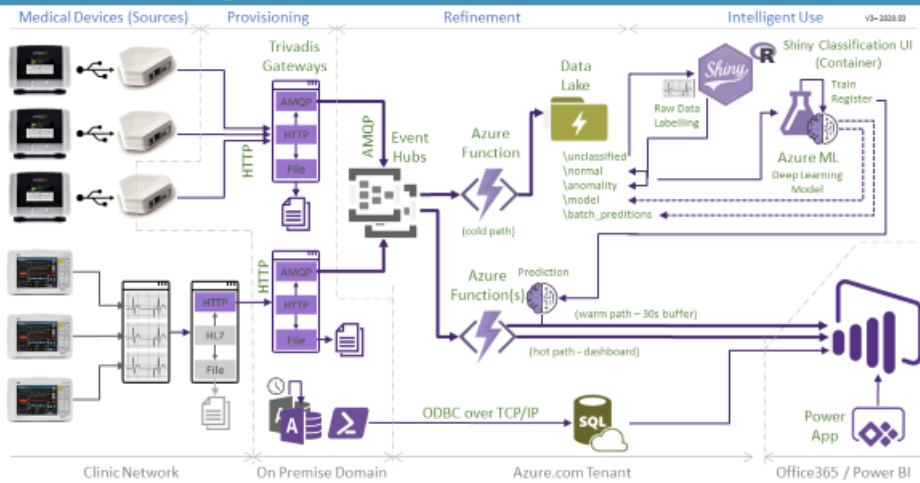
NEW

Video Analysis of Movement

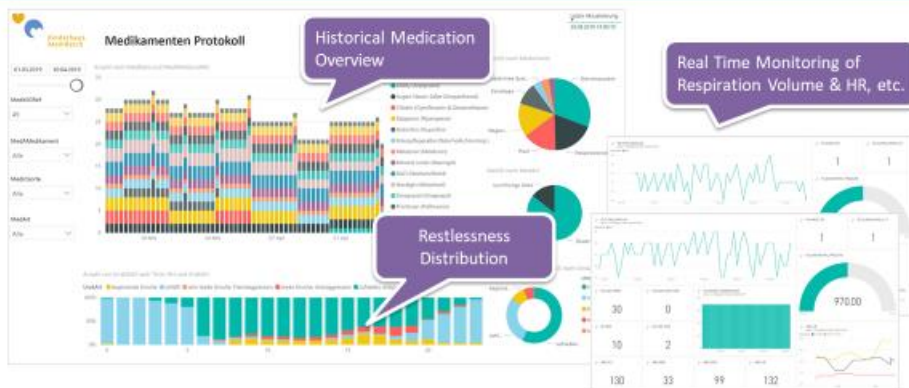
Understanding trivadis



Architecture Big Picture trivadis



The Power of Data & Analytics trivadis



Analytics step

Ventilators

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Manufacturer:

Dräger, ResMed, Breas

Main components:

valves, trolley, display, ventilation units, ...

Ventilator modes:

volume control, pressure control, hybrid, active, passive, ...



Available Data (Time series)

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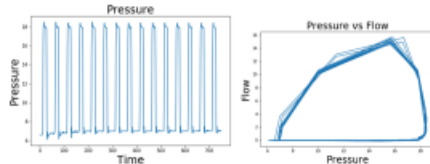
High Frequency

Ventilator main waveforms:

- Volume vs time
- Pressure vs time
- Flow vs time: inspiration and expiration

Loops:

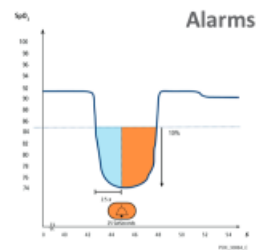
- Pressure vs Volume
- Flow vs Volume



Low Frequency

Other important features:

PEEP, SpO2, VT, Ti, Mv, RR, ...



AI Problem

When will a condition occur again?

In what specific state was the child during this time?

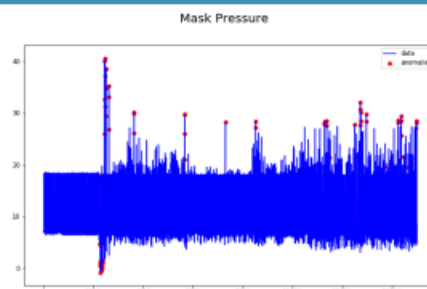
When is a child in an anomalous state?



Anomalies

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Using One Class SVM for Anomaly Detection



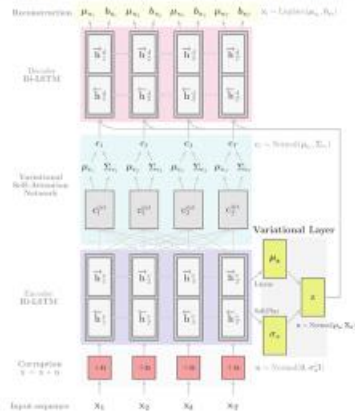


Fig. 1. Variational Bi-LSTM Autoencoder with Variational Self-Attention.

Ref: Pereira, Joao, and Margarida Silveira. "Unsupervised anomaly detection in energy time series data using variational recurrent autoencoders with attention." *2018 17th IEEE International Conference on Machine Learning and Applications (ICMLA)*. IEEE, 2018.

The banner features the text "Trivadis Team" in a large, white font against a dark background with a white line graph. On the left, there are four icons representing "Employees", "Customers", "Partner", and "Better Together". Below the banner, there are five headshots of team members and logos for "Dräger", "BRES", and "Microsoft".

Making a **WORLD** possible
 in which **intelligent IT**
 facilitates **LIFE** and **WORK** as a
matter of course.

Trivadis – Together for a smarter life

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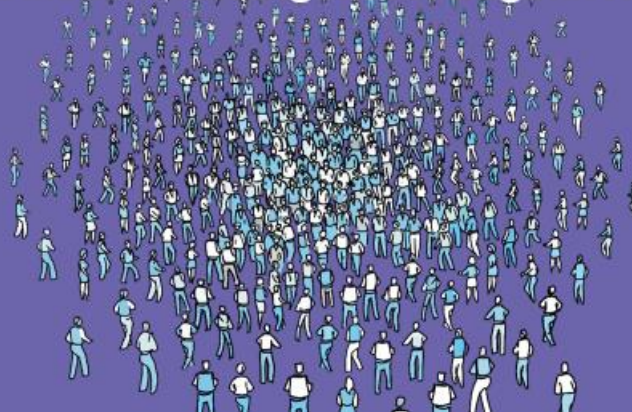
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Wir sind

**Über 700 Spezialisten/innen,
die sich für intelligente IT begeistern**



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Wir sind

- eine DACH-Company mit Schweizer Wurzeln
- seit 25 Jahren am Markt
- ein IT-Dienstleistungsunternehmen, das zusammen mit Kunden und Partnern die digitale Zukunft gestaltet



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Wir wollen

Eine **WELT** ermöglichen,
in der **intelligente IT**
LEBEN und ARBEITEN
völlig selbstverständlich
erleichtert.

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Wir wollen

- Erneuerbare Energien günstiger
- Mobilität intelligenter
- Tierzucht gesünder
- Soziale Pflege menschlicher
und vieles andere leichter machen



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Wir nutzen unsere Stärken

Daten sind unsere DNA

- als Datenbankspezialist gestartet
- heute fokussiert auf Daten-Management und -Analyse
- wandeln wir Daten in Mehrwerte für unsere Kunden und Partner um



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Gelebter Wissenstransfer

- Wir vermehren Wissen und Erfahrungen in einem lebendigen Netzwerk
- 100 Consultants als Trainer/innen aktiv
- Praxisnahe Schulungen befähigen, komplexe Anforderungen zu bewältigen



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Organisch gewachsen

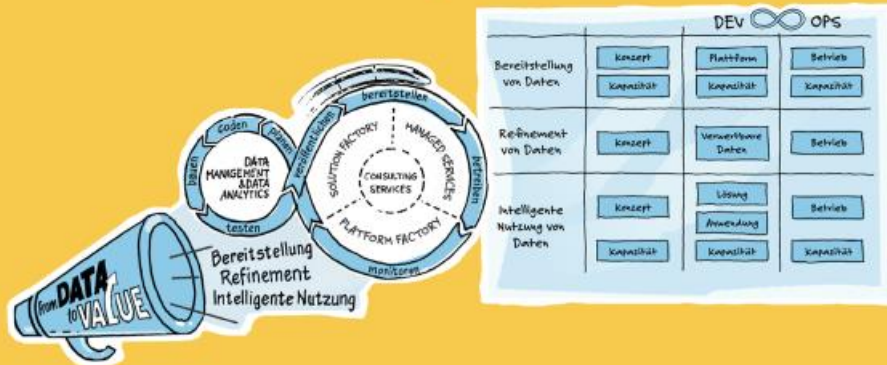
- 1994 zu dritt gestartet
- heute 700 Mitarbeitende an 15 Workspaces in 4 Ländern
- enge Zusammenarbeit über Standort- und Ländergrenzen hinweg



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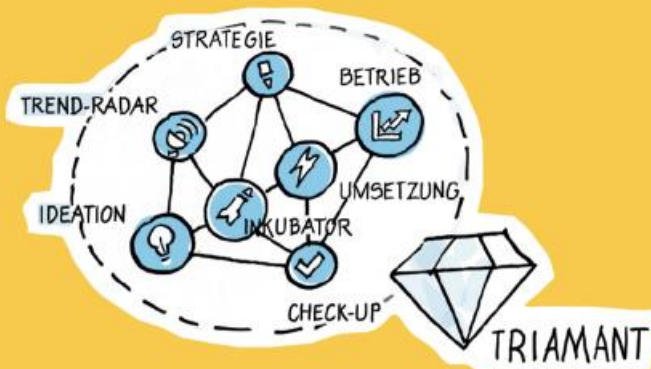
Wir bieten

Ganzheitliche Leistungen



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Vielfältige Ansatzpunkte



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Modernste Methoden



Standort-
übergreifende
Zusammenarbeit



Flexible,
bedarfsorientierte
Organisation



Agile
Umsetzung

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Sie haben Interesse an mehr?



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