

AI FOR MANUFACTURING PROCESSES

DETECT



DIGITAL TWIN bei der Gerhards Kunststofftechnik

Gefördert durch das Land Nordrhein-Westfalen und
begleitet von der Effizienz-Agentur NRW

Symate GmbH

Confidential content – Release for internal use only

DETECT® AI-Infrastructure & Apps

Manufacturing Data Experts

Building up a dedicated AI infrastructure with Detect



Staff: around 30 digital natives, experts, developers, designers, managers, sales people, testers, innovators & service experts

Certified processes & model factory as test center



Average age: 32 years; new hiring of 5-6 employees per year



100+ customers | 1.500+ connected lines | 20+ active AI-apps in 2022



Close cooperation with Fraunhofer and TU Dresden: 10 ongoing research projects in 2022

Way we work: agile, flexible, professional, digital





2010: RESEARCH FOUNDATIONS

- Research results from DFG Collaborative Research Center 639
- Funding through the ECEMP Excellence Cluster
- Establishment of the core team at the Technical University of Dresden



2012: SYMATE IS FOUNDED

- Successful spin-off from TU Dresden
- Funding through major programs of the federal government, the Free State of Saxony & the EU
- Symate enters into development partnership with TU Dresden
- Market entry with Detect 1.0



2018: SYMATE EXPANDS IN THE PLASTICS INDUSTRY

- Symate develops for DAX companies like Volkswagen and Covestro
- Launch of new technology stack with Detect 2.0
- Number of employees reached 20



2021: DIVERSIFICATION

- Contract to build the Leibniz Institute's largest AI model factory
- Acquisition of key accounts from battery production
- Move to new office space with 400 sqm
- Number of customers rises above 100

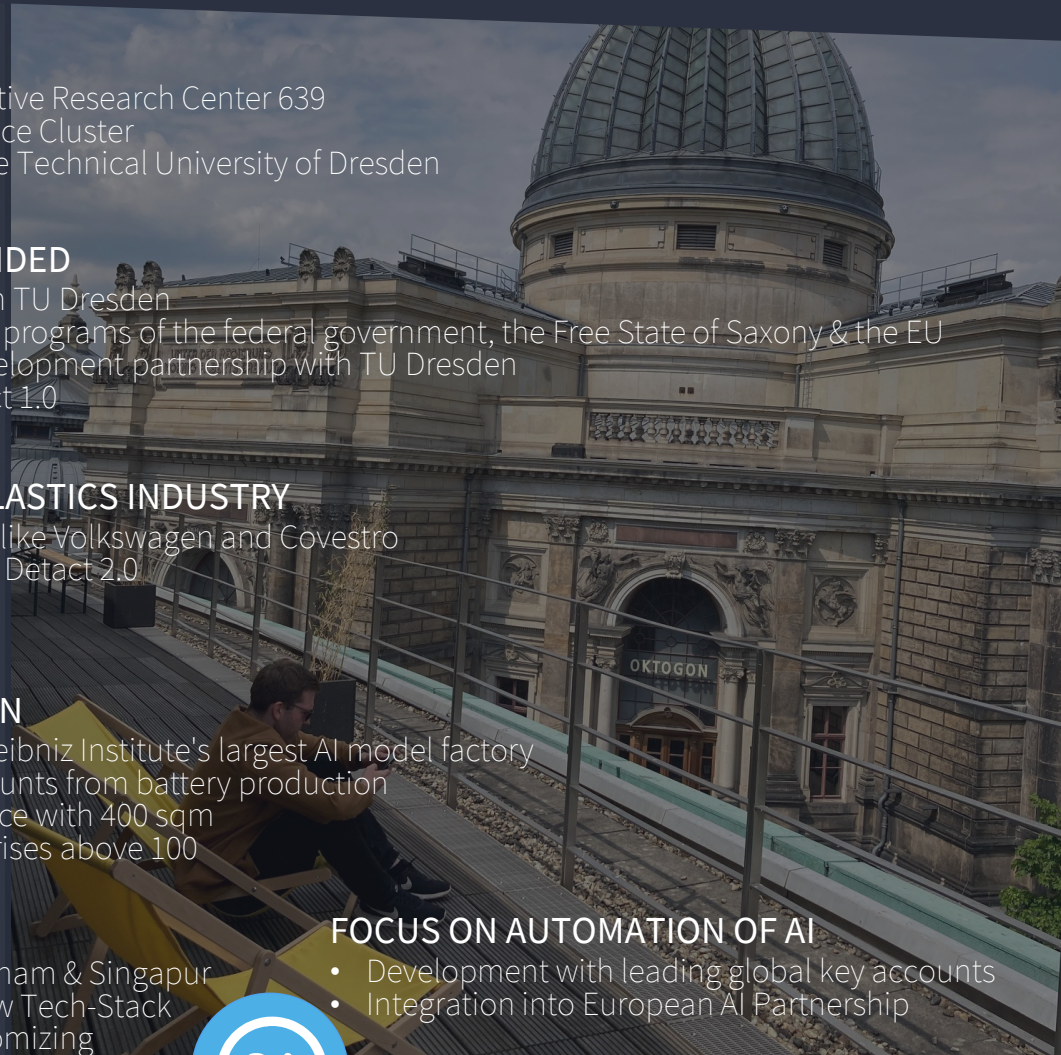


2022: INTERNATIONAL GROWTH

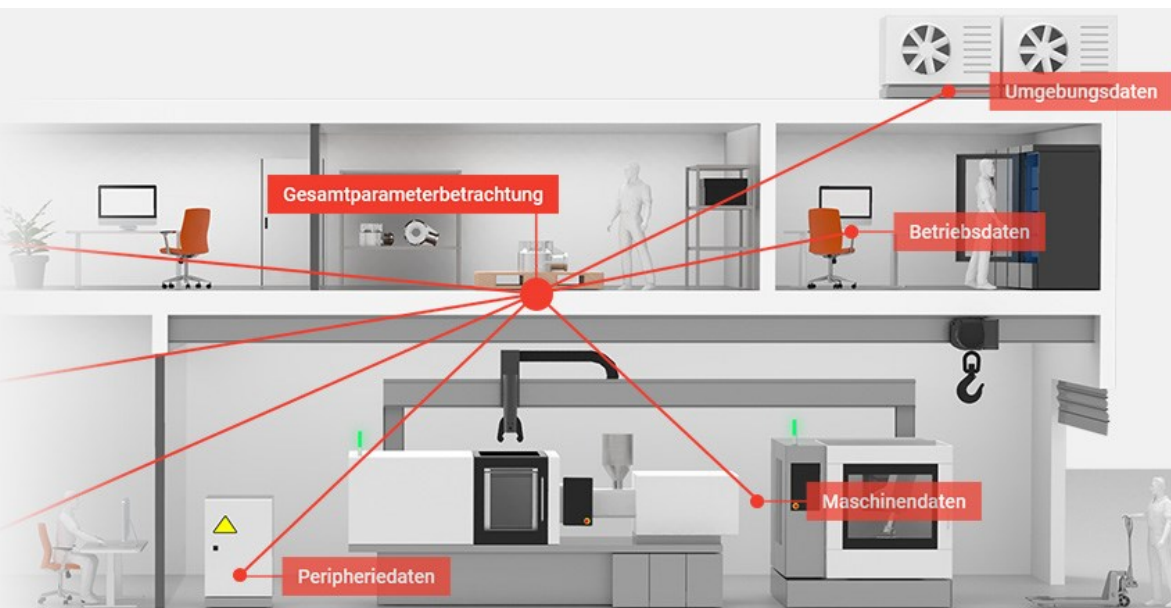
- Installations in UK, USA, China, Vietnam & Singapur
- Launch of Detect 3.0 with entire new Tech-Stack
- High standardization and self-customizing

FOCUS ON AUTOMATION OF AI

- Development with leading global key accounts
- Integration into European AI Partnership



Automated Data Merging with Detact

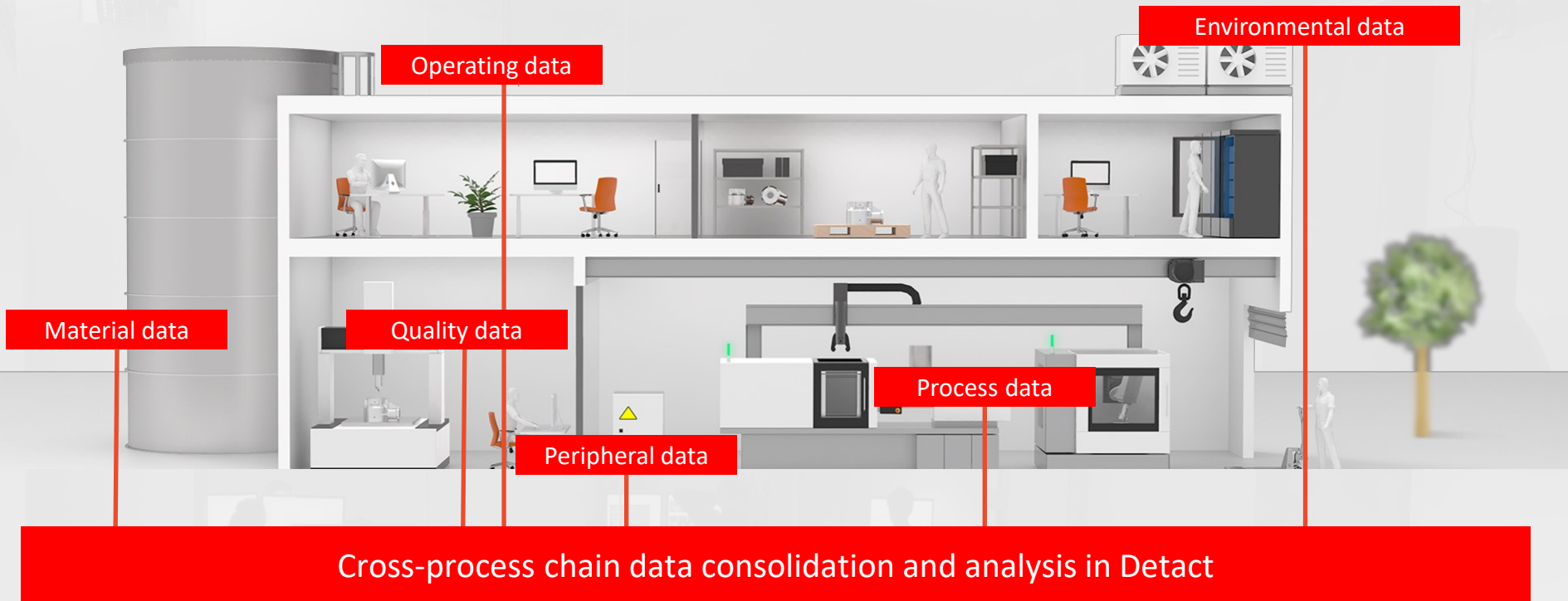


A superordinate platform for the holistic evaluation of processes. Detact is the tool for comprehensive data consolidation and analysis! The AI system links manufacturing parameters, product characteristics and quality features.

If required, this can even be done fully automatically and according to your specific specifications.

“We are impressed by the automatic merging of operating and quality parameters for cross-process evaluations.”

CarboLife technologies GmbH



Detact is THE tool for the intelligent consolidation of data in manufacturing!

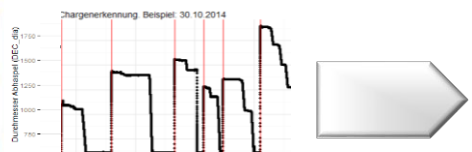
“Detact brings together all relevant data sources at a higher level and automatically analyzes the information obtained. This is perfect for us! In addition, the results are visualized location-independently and in real time.”

Institute of Construction Materials, TU Dresden

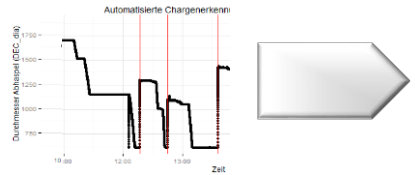
Connection to data sources

sz.start	sz.end	sz.matgau	sz.matwidth	sap.Verarb.Zeit	sap.Qüte	sap.Dicke	sap.Colbreite	sap.Kombi	sap.Charge
2014-10-30 09:39:41	2014-10-30 01:24:37	3.00	1376	2014-10-30 01:04:05	S420MC	3.00	1365	200096894	R205167771
2014-10-30 01:27:26	2014-10-30 02:06:36	1.20	1299	2014-10-30 02:01:50	HC420LA	1.25	1280	200096413	R205167174
2014-10-30 02:09:06	2014-10-30 02:39:35	2.00	1476	2014-10-30 02:31:49	HC420LA	2.00	1470	200096710	R205167200
2014-10-30 02:42:19	2014-10-30 04:09:34	2.00	1487	2014-10-30 03:37:37	HC420LA	2.00	1470	200096710	R205167647
2014-10-30 04:11:02	2014-10-30 04:39:52	2.00	1487	2014-10-30 04:17:27	HC420LA	2.00	1470	200096710	R205167710
2014-10-30 04:42:20	2014-10-30 05:27:57	2.50	1337	2014-10-30 05:19:43	Z20+Z	2.50	1320	200096874	R205168440
2014-10-30 05:30:51	2014-10-30 06:16:47	2.50	1165	2014-10-30 06:02:02	S460MC	2.50	1150	200096908	R205165064
2014-10-30 06:22:20	2014-10-30 06:57:41	1.50	1003	2014-10-30 06:38:01	HC380LA	1.50	990	200096900	R205167957
2014-10-30 07:24:21	2014-10-30 08:14:05	1.00	1300	2014-10-30 07:21:53	HC340LA	1.00	1290	200096980	R205168954
2014-10-30 08:12:17	2014-10-30 08:57:41	1.00	1315	2014-10-30 08:21:51	HC340LA	1.00	1290	200096480	R205167194
2014-10-30 08:57:41	2014-10-30 09:38:01	1.00	1315	2014-10-30 08:53:06	HC340LA	1.00	1290	200096480	R205167195
2014-10-30 09:38:01	2014-10-30 10:11:04	1.00	1315	2014-10-30 10:11:04	HC340LA	1.00	1290	200096480	R205167415
2014-10-30 10:11:04	2014-10-30 12:10:12	2.20+Z	0.65	220+Z	0.65	1530	200096879	Z205165932	
2014-10-30 12:17:04	2014-10-30 12:42:45	1.40	1505	2014-10-30 12:44:14	HC3700V+Z	1.40	1500	200096804	Z205167934

infor
OPERATING DATA Infor-DB



PROCESS DATA EU63 / EU77 / OPC



ENERGY DATA



Batches		InspItems		Specimens	
SID	tinyint	SID	tinyint	SID	tinyint
BatchID	int	InspItemID	int	SpecNo	tinyint
StartDate	datetime	Type	nvarchar(8)	ProdLine	tinyint
BatchName	nvarchar(32)	DataTyp	nvarchar(8)	BatchID	int
ProdName	nvarchar(64)	ParentID	int	InspDate	datetime
ProdVer	int	Unit	nvarchar(8)	OK	tinyint
BatchID	int	BasePrecision	tinyint	Classific	tinyint
Produced	int	Optional	tinyint		
		Name	nvarchar(32)		
		FullName	nvarchar(128)		
		TolModel	nvarchar(32)		
		Modules	nvarchar(128)		

PERIPHERY DATA

IML-DB

Data fusion and AI deployment



Manual Data Collection



For each data source and any number of interfaces

Automated direct connection to your data sources via Detact Connect. Detact captures data volumes that are permanently generated in production. The AI control center even integrates data from physically separate system areas such as machine data, operating data, quality data from measuring and testing devices, peripheral data, environmental data, (Excel) files, data from third-party software such as ERP, BDE or CAQ systems.

“It's impressive how many data sources Detact can handle.”

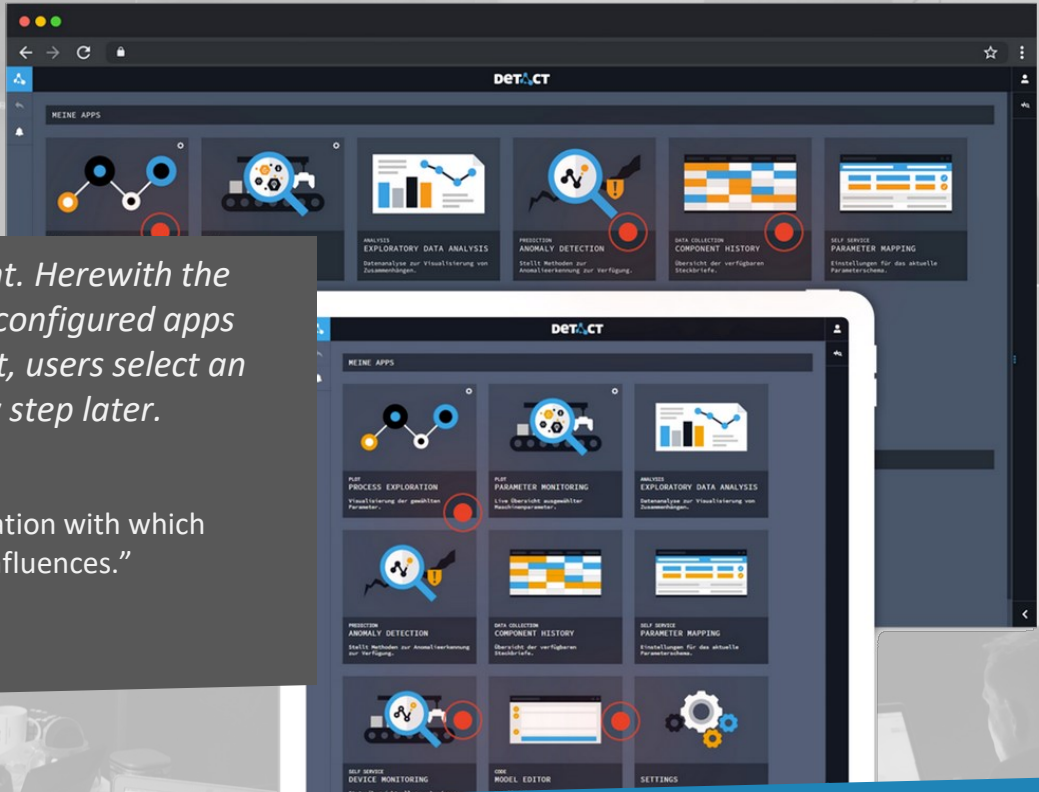
Plant management of a Tier 1 automotive manufacturer

OPC UA/DA	Euromap 63/77	ENGEL EMI	Beckhoff Twincat ADS	Siemens S5/S7
LabVIEW	Excel	Customize your own Detact Connect Driver	Manual Data Collection	

+ Mehr anzeigen



15+ Browser-based apps for analysis and diagnostics



Detact automates data analysis and makes it intelligent. Herewith the software system was equipped with a multitude of preconfigured apps and artificial intelligence (AI). At the start of the project, users select an individual app package, which they can expand step by step later.


“What we appreciate about Detact is the high degree of automation with which the program gives us transparency about the decisive process influences.”

AUDI AG

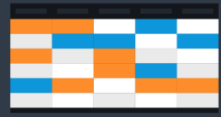
Browser address bar: <http://detact.de>

DETECT

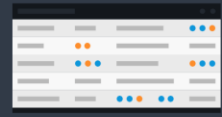
WILLKOMMEN
DASHBOARD




**PLOT
PROCESS EXPLORATION**
Visualisierung der gewählten Parameter.




COMPONENT HISTORY
Übersicht der gefertigten Bauteile im gewählten Gießzeitraum



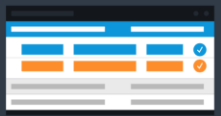
PROCESS PERFORMANCE
Übersicht der Ausschusszahlen im gewählten Gießzeitraum




DEFECT ANALYSIS
Visualisiert Bauteilfehler für ausgewählte Prozessschritte



DOWNTIME ANALYSIS
Zeigt Informationen zu Stillständen und Fehlermeldungen




**SELF SERVICE
PARAMETER MAPPING**
Einstellungen für das aktuelle Parameterschema.




SETTINGS
Übersicht der verfügbaren Einstellungen.

**SOFORT
VERFÜGBARE APPS**


VERTRIEB




**PLOT
PARAMETER MONITORING**
Live Übersicht ausgewählter Maschinenparameter.




**ANALYSIS
EXPLORATORY DATA ANALYSIS**
Datenanalyse zur Visualisierung von Zusammenhängen.



**PREDICTION
ANOMALY DETECTION**
Stellt Methoden zur Anomalieerkennung zur Verfügung.



**DATA COLLECTION
MANUAL DATA COLLECTION**
Enthält Bildschirmmasken für die manuelle Eingabe von Daten.



**SELF SERVICE
DEVICE MONITORING**
Statusübersicht aller verbundenen Datenquellen.

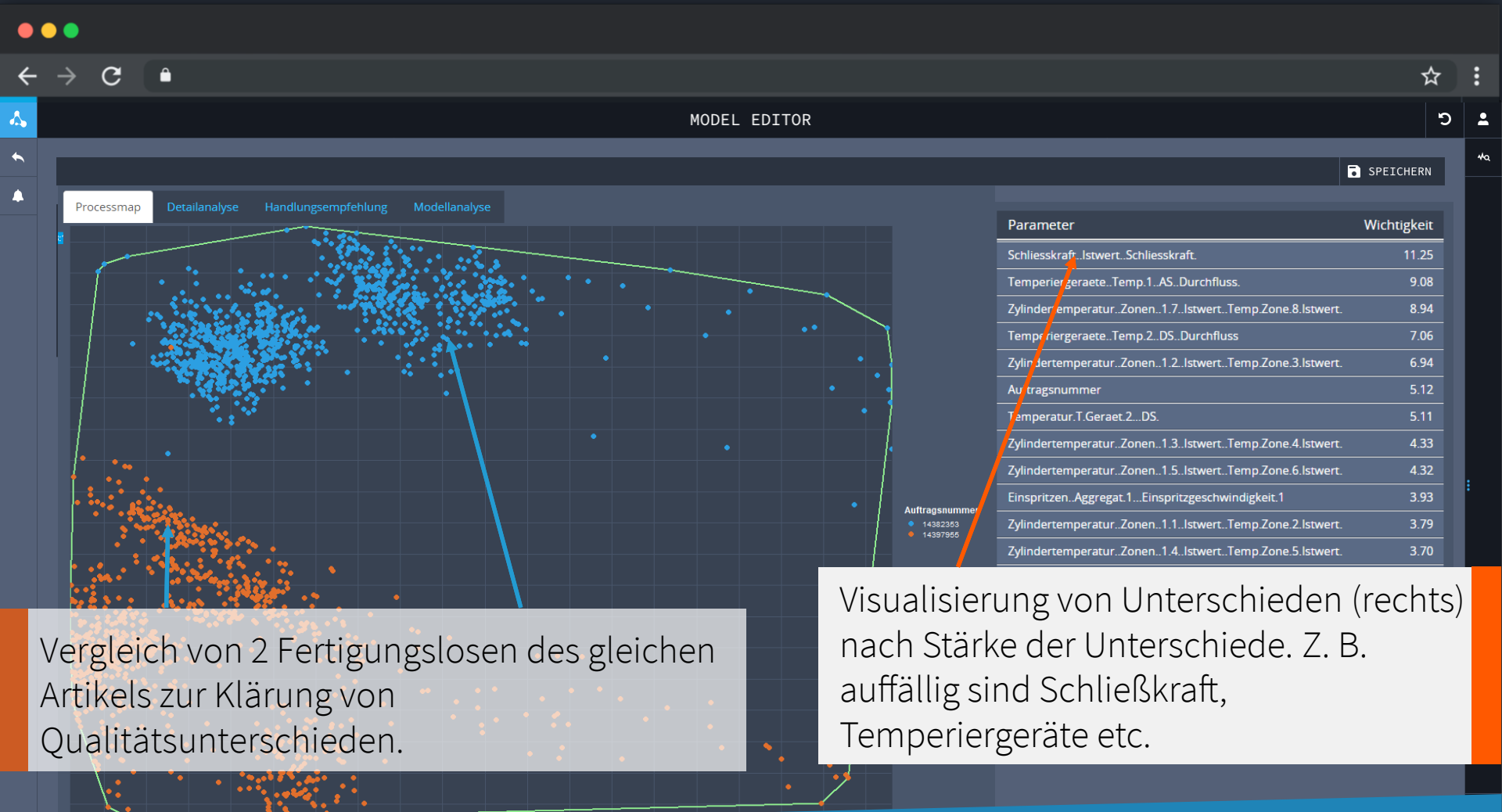
Process Exploration

07.04.2019 22:50:11 | 10.04.2019 04:59:52



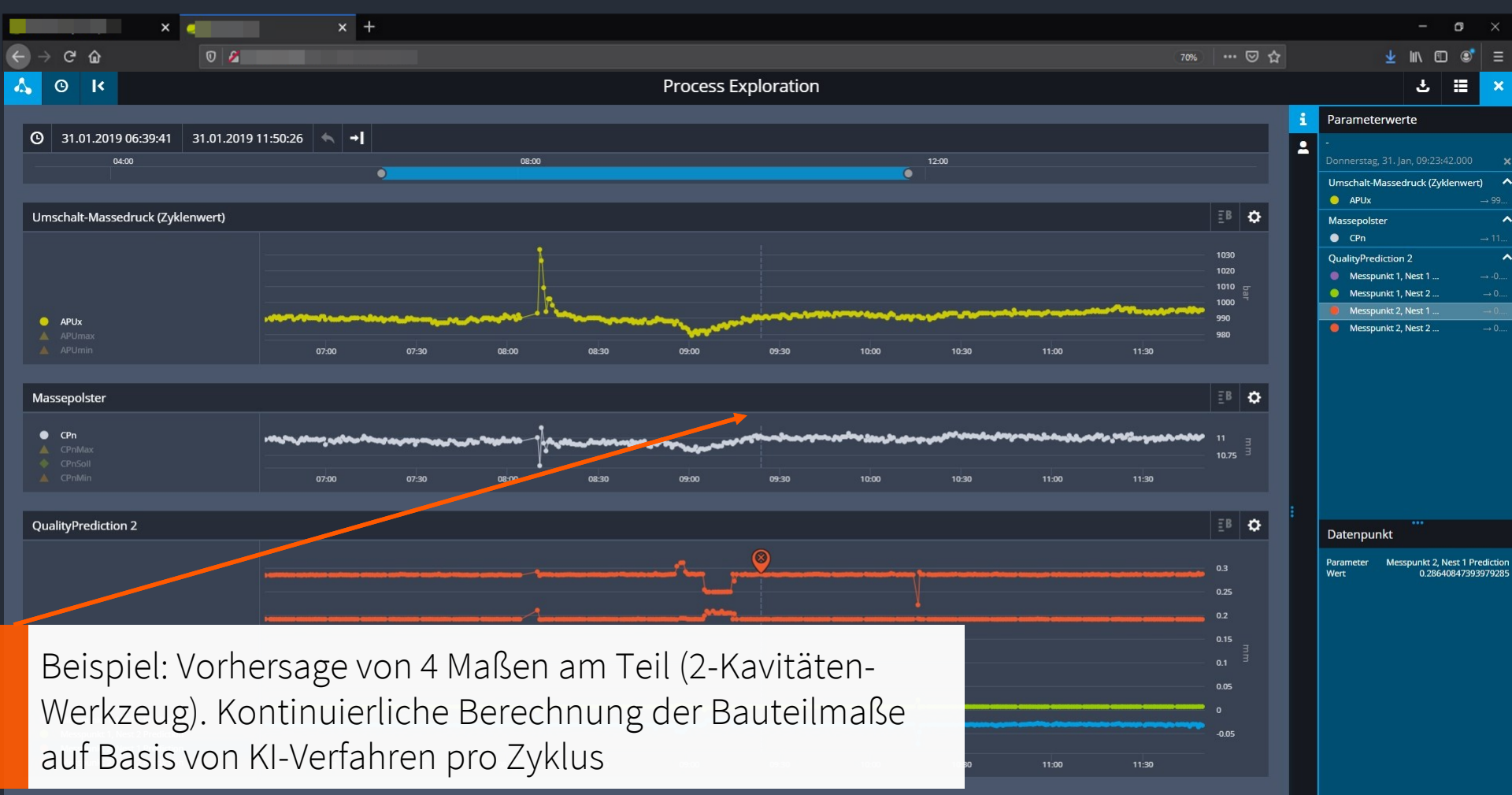
Parameter list on the right side of the interface:

- Parameterwert
- Dienstag, 9. Apr
- Massepolster
- CPn
- CPnSoll
- Trockner 1
- Trockneranlage
- Datenpunkt
- Parameterwert



Vergleich von 2 Fertigungslosen des gleichen Artikels zur Klärung von Qualitätsunterschieden.

Visualisierung von Unterschieden (rechts) nach Stärke der Unterschiede. Z. B. auffällig sind Schließkraft, Temperiergeräte etc.



Beispiel: Vorhersage von 4 Maßen am Teil (2-Kavitäten-Werkzeug). Kontinuierliche Berechnung der Bauteilmaße auf Basis von KI-Verfahren pro Zyklus

●

Vollautomatische

MASCHINENSTATUS

↓
5.93

↑
50.91

↓
10.58

LISTE DISCRETE 01

05.12.2018 09:00:00	⚠ Anlage nicht betriebsbereit
05.12.2018 10:00:00	! Wechselschritt im Grenzbereich
04.12.2018 18:00:00	? Wechsel Betriebsmodus
04.12.2018 06:00:00	⚠ Zykluszeit überschritten
03.12.2018 18:00:00	⚠ Anlage nicht betriebsbereit
03.12.2018 12:00:00	⚠ Zykluszeit überschritten
03.12.2018 18:00:00	⚠ Anlage nicht betriebsbereit

LISTE DISCRETE 02

05.12.2018 09:00:00	? Anlage nicht erreichbar
05.12.2018 10:00:00	! Wechselschritt im Grenzbereich
04.12.2018 18:00:00	✔ Wechsel Betriebsmodus

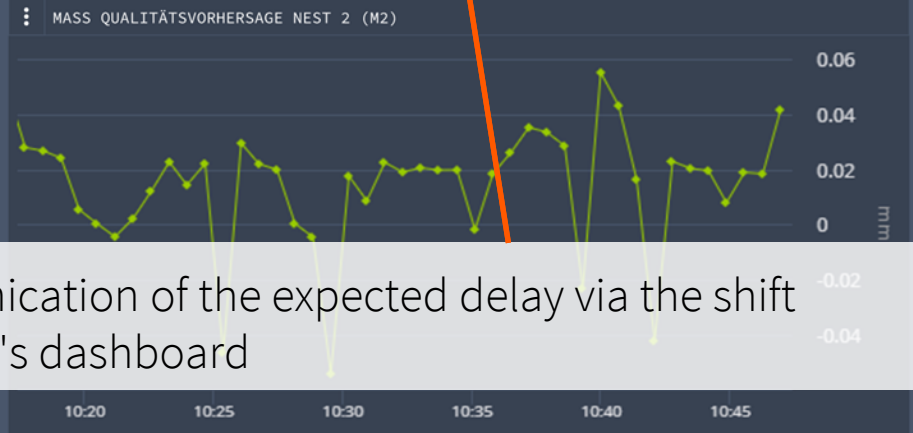
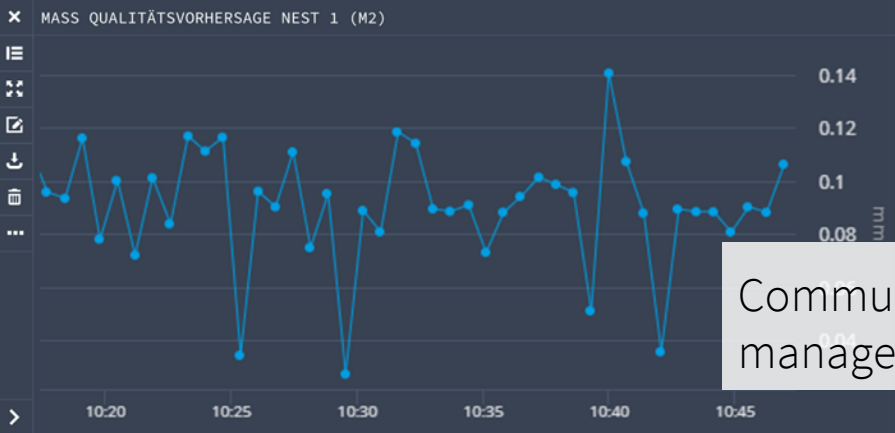
⚡

13.12.2019 | 10:55:02

Verzug
über Grenzwert!

QUALITÄT

13.12.2019 10:55:02	⚡ n10
13.12.2019 08:20:02	✔ i10
13.12.2019 06:02:01	✔ i10



Communication of the expected delay via the shift manager's dashboard

Analyse



Suche

Groß- / Kleinschreibung ignorieren

Anzeige

- Zeige nur passende Elemente
- Zeige nur öffentliche Elemente

Analysen gruppieren

- Nicht gruppieren
- Nach Paketname
- Nach Typ
- Nach Paketname und Typ
- Nach Typ und Paketname

- Bibliotheken und Treiber einzeln
- Zeige interne Namen
- Zeige Tags

Debugger

Debug-Flags

Hinweis: Darstellung der guten Vorhersagegenauigkeit. Es wird fast jedes NIO-Teil auch im Prozess vorhergesagt. Obere Schwimmbahn „Vorhersage/KI“; untere Schwimmbahn Realität. Jeder Schuss ist ein Kästchen



Digital assistants for machine operators

Mobile options for recording feedback on operating orders, shifts, errors, malfunctions, part removals, etc. Artificial intelligence supports decisions and facilitates the work of plant operators!

"Detact [...] relies on artificial intelligence methods, and we envision the Detact apps providing us with previously unknown insights into our process."

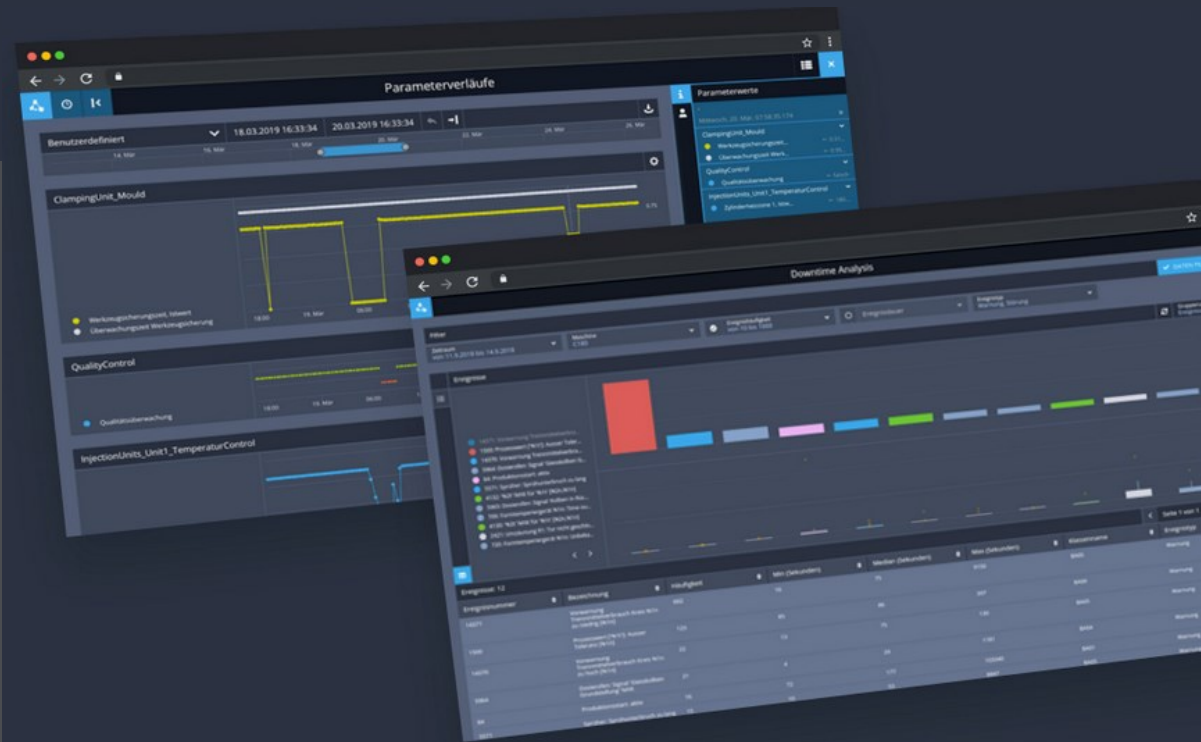
Weidplas Germany

More productivity for your process monitoring

Detact is a superior platform for the synchronization, analysis and visualization of your data! Keep process, quality, peripheral and environmental data in view at all times. Fully automatic!

“Symate's flexible AI system generates valuable information for us, which we use to optimize the process so that it runs stably and highly efficiently. At the same time, we have a continuous view of the quality of the products and can identify potential influencing factors at an early stage.”

Kunststoff Zentrum in Leipzig gGmbH (KUZ)



Take the load off your quality assurance!

Detect problems before they occur! With dynamic test concepts you can adjust the test frequency and depth based on a data-based process validation. In this way, you sustainably relieve your quality management.

“We are impressed by the automatic merging of operating and quality parameters for cross-process evaluations.”

CarboLife technologies GmbH

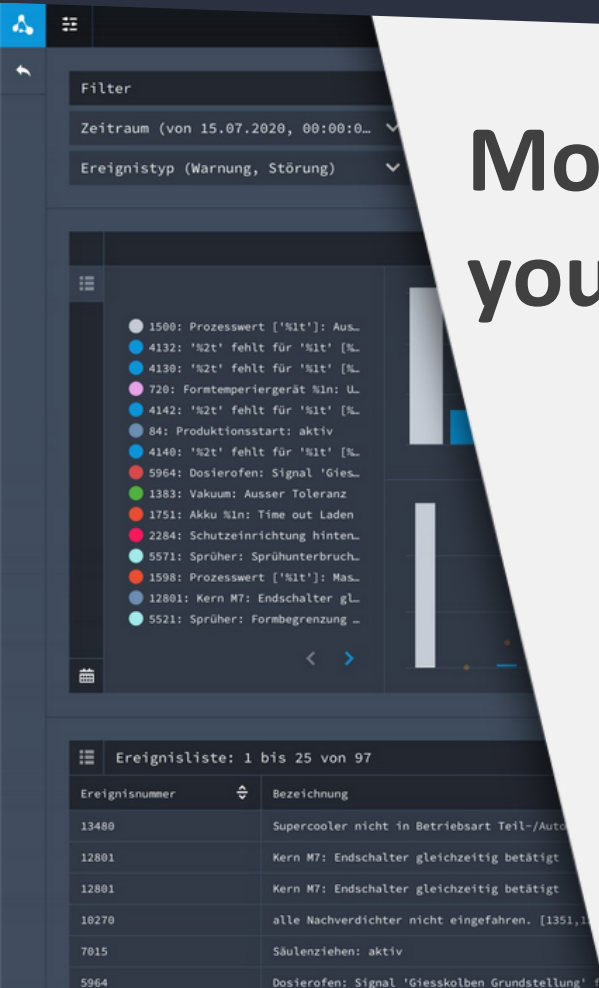


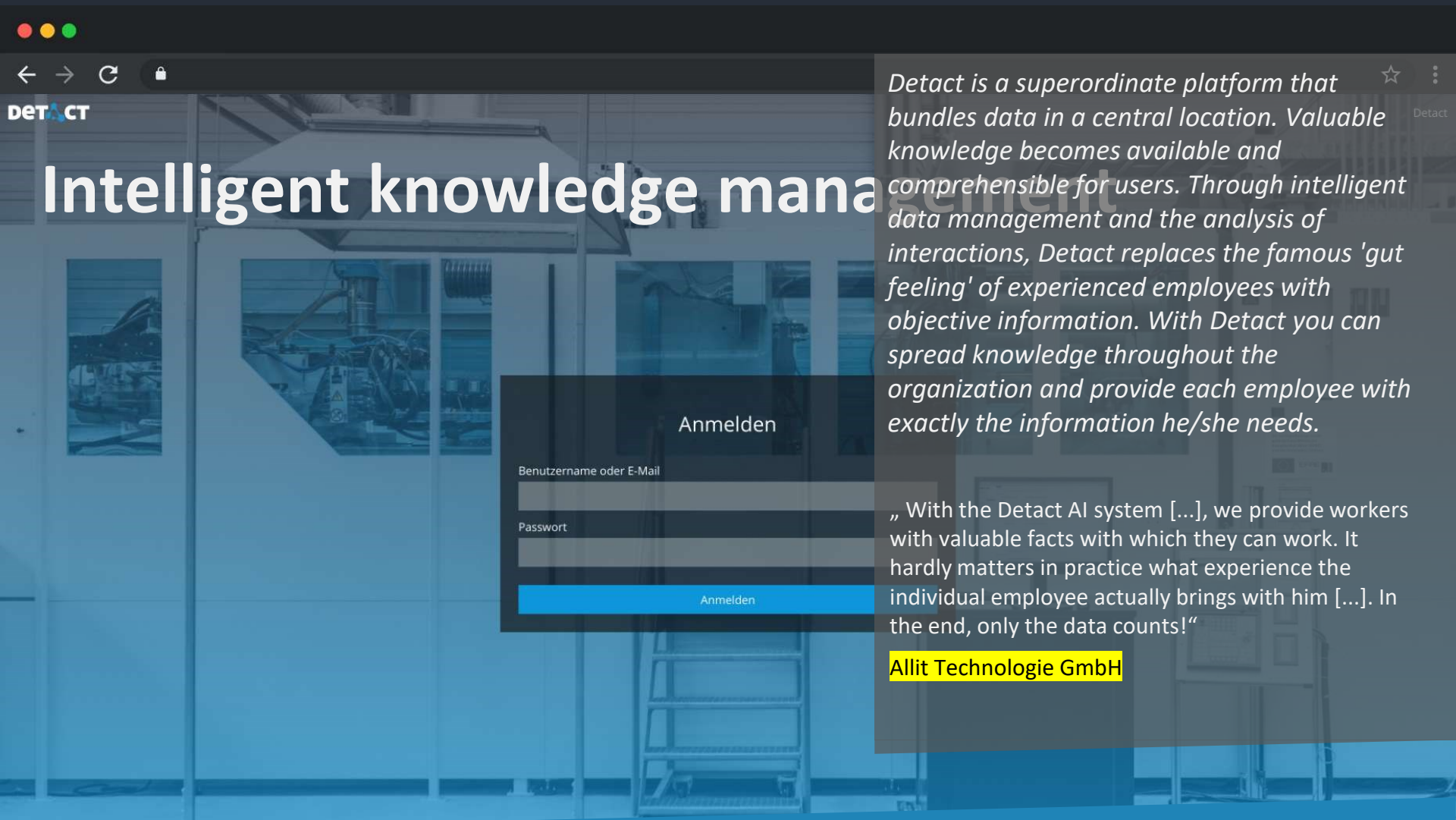
More decision making reliability for your maintenance!

Make your decisions quickly and objectively! The Detact apps for Predictive Maintenance and Condition Monitoring, among others, are one step ahead of your processes. You can plan your maintenance work on the basis of reliable data and ensure the quality of your processes on a predictive level.

"Detact [...] relies on artificial intelligence methods, and we envision the Detact apps providing us with previously unknown insights into our process."

Weidplas Germany





Intelligent knowledge management

Anmelden

Benutzername oder E-Mail

Passwort

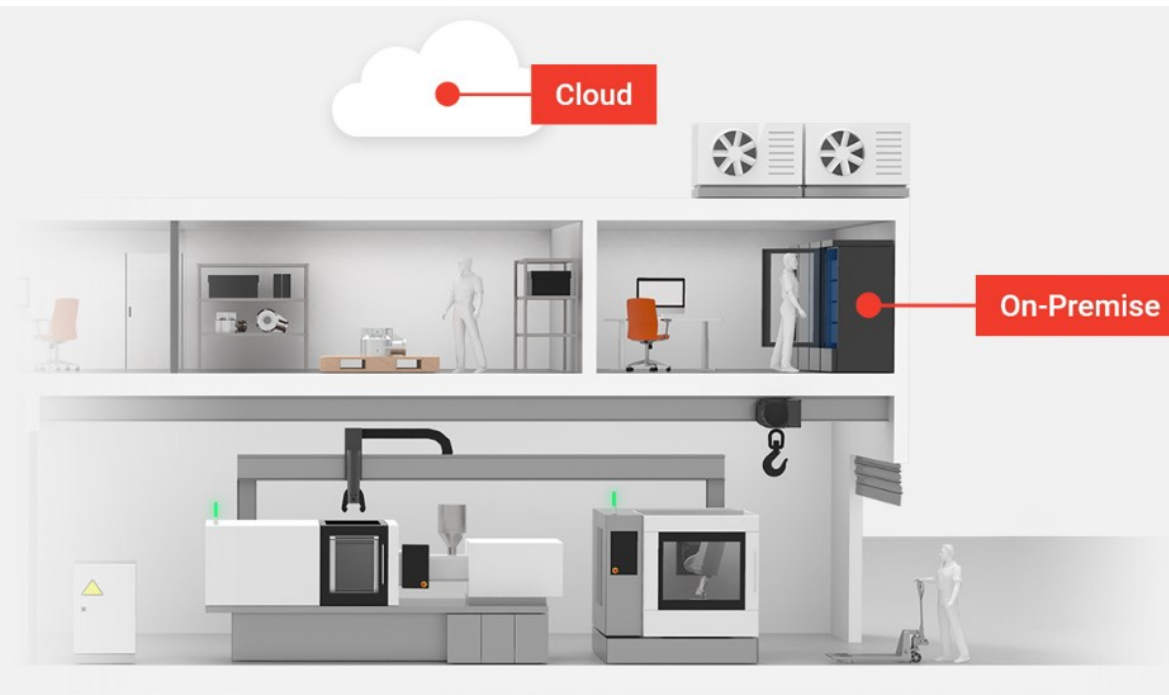
Anmelden

Detact is a superordinate platform that bundles data in a central location. Valuable knowledge becomes available and comprehensible for users. Through intelligent data management and the analysis of interactions, Detact replaces the famous 'gut feeling' of experienced employees with objective information. With Detact you can spread knowledge throughout the organization and provide each employee with exactly the information he/she needs.

„ With the Detact AI system [...], we provide workers with valuable facts with which they can work. It hardly matters in practice what experience the individual employee actually brings with him [...]. In the end, only the data counts!“

Allit Technologie GmbH

Cloud or On-Premises



Decide for yourself whether you use Detect via the Symate Cloud or on-premises on your own servers!

"We are glad that the setup of Detect went so quickly and smoothly. The Symate team handled almost all the tasks remotely and got Detect deployed in no time."

Production manager of a renowned specialist for plastics and injection molding technology

Single Server vs. Cluster

Connect your process chains e.g. with a single server solution. If this "small" system convinces you, you can easily expand to any number of servers later. The special architecture of Detect is perfectly suited for Big-Data. The system is highly scalable (clustering) and parallelizable. In contrast to conventional MES and control systems, Detect can record or analyze a large amount of data simultaneously.

"It is advantageous that [...] Detect can respond very individually to the concrete requirements in the company and not simply impose a rigid, prefabricated concept. This results in solutions that really help us."

Hugo Stiehl GmbH

Data Science and Analytic Support

On-demand support for quality problems and process disruptions

Trouble-Shooting Support

Support for project startups (Ramp-Up-Assistance)

Analysis for CIP measures

Q-Problem Analysis

Downtime analysis

Training and installation of AI algorithms for component families

Optional: Premium 24/7 Support (Shift accompanying)



Teaching

Support for your Data Scientists and Technologists

Training in AI methods (development, deployment, maintenance)

Detact configuration training

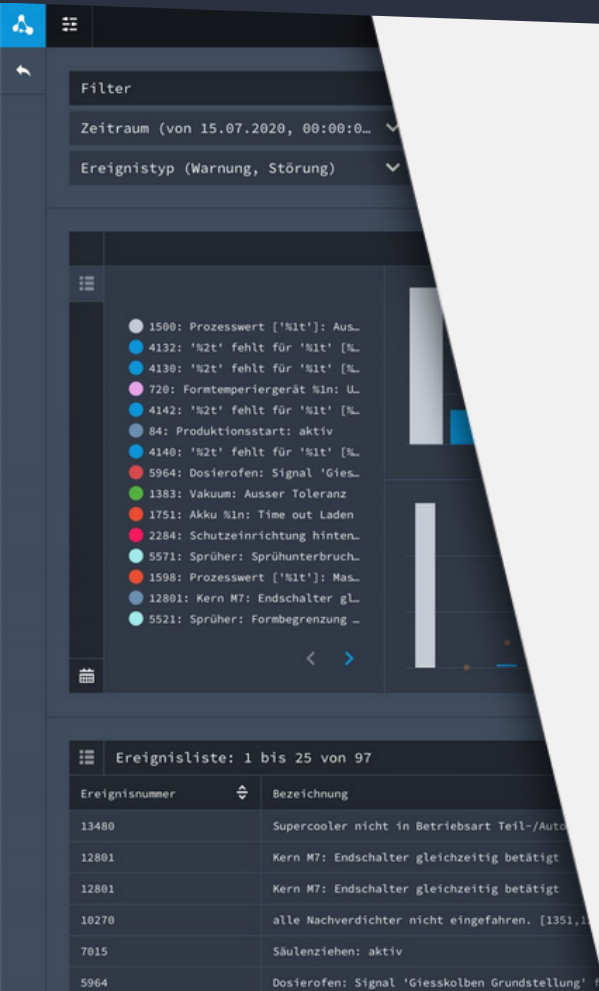
Training on how to use Detact

Training for the connection external data sources

Trainings in Python, R, Scala

Collaborative analytics for AI apps

Deployment Data Scientist Functions: Detact Browser Notebook & Detact Analytic Suite



Service and maintenance

Standard and premium maintenance packages incl. project management and 24/7 service hours

Advice on application problems in Detect

Ongoing interface adjustments

Architecture extension as needed

Readiness and service hours up to 24/7

Regular updates, upgrades and patches

Optional: Server operating system maintenance



We are here for you!

Symate GmbH | Georg-Treu-Platz 3 | 01067 Dresden | Germany | www.detact.de