

Herzlich Willkommen zur Informationsveranstaltung

# Auftakt WorkCamp – Maschinelles Lernen / Künstliche Intelligenz

Donnerstag, 28. Februar 2019

WLAN-Zugang: IHK-Gast

<http://www.github.com/mediagit2016>



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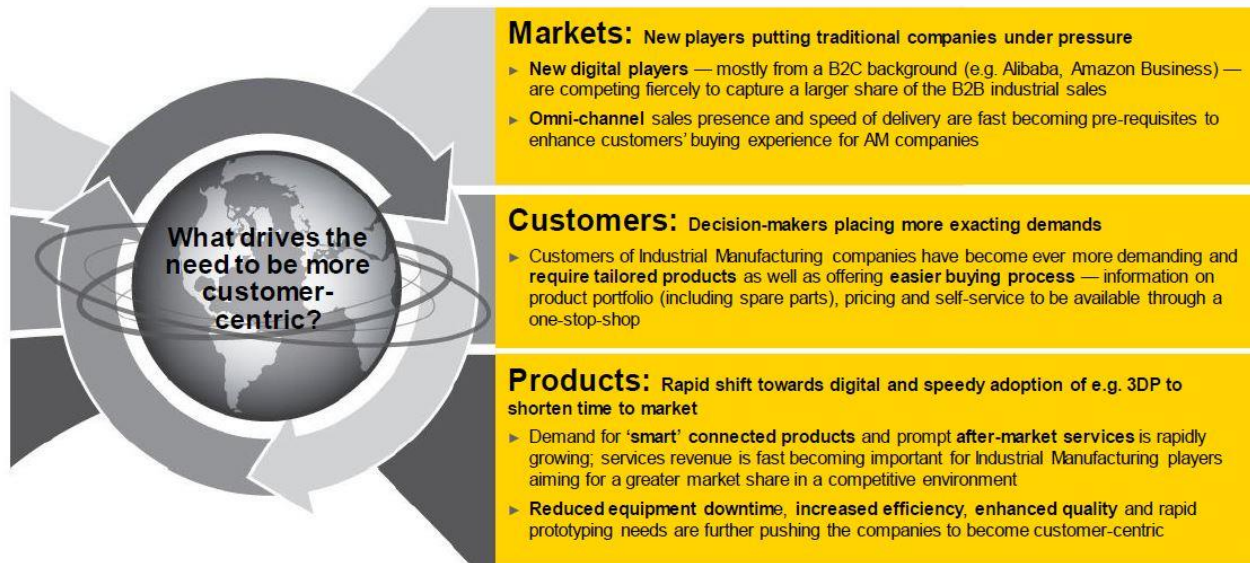
Fax 0711 2005-601516

\* Technologietransfermanager



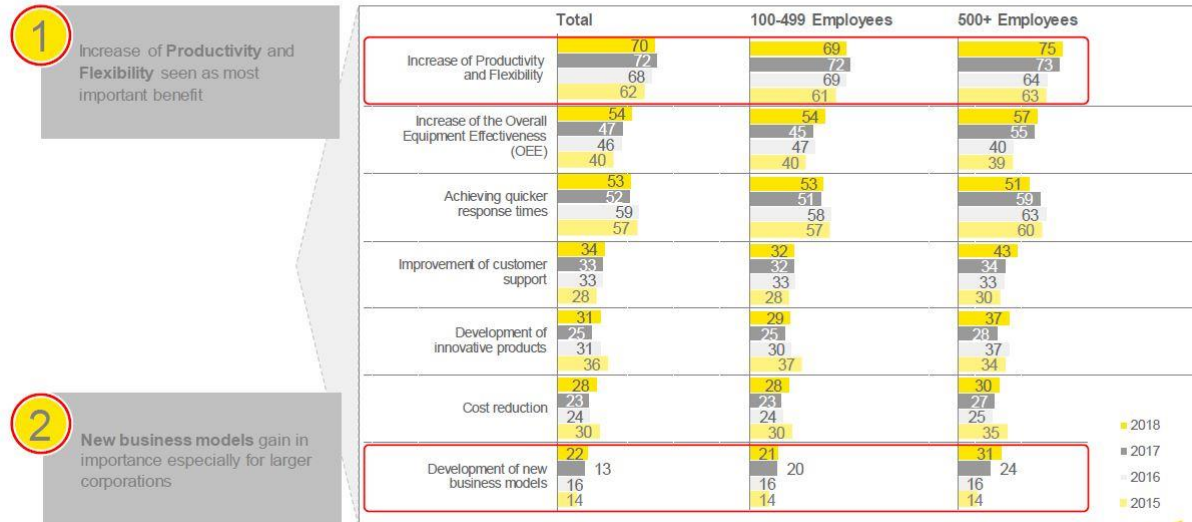
# Herausforderungen für den Maschinenbau

## Rising customer centricity



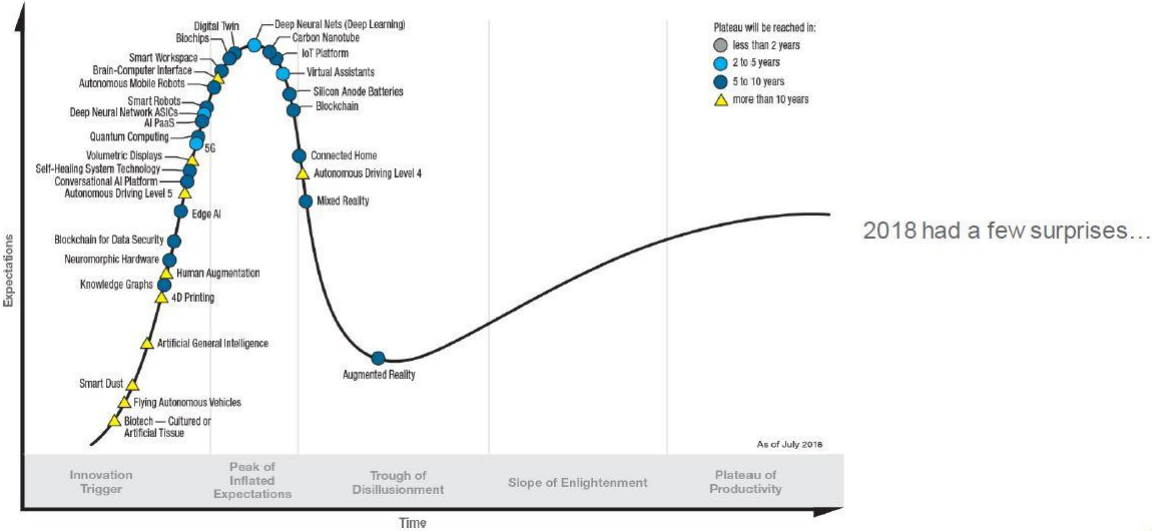
Quelle: EY - bitkom

## Potential benefits from IoT and Industrie 4.0 in Germany



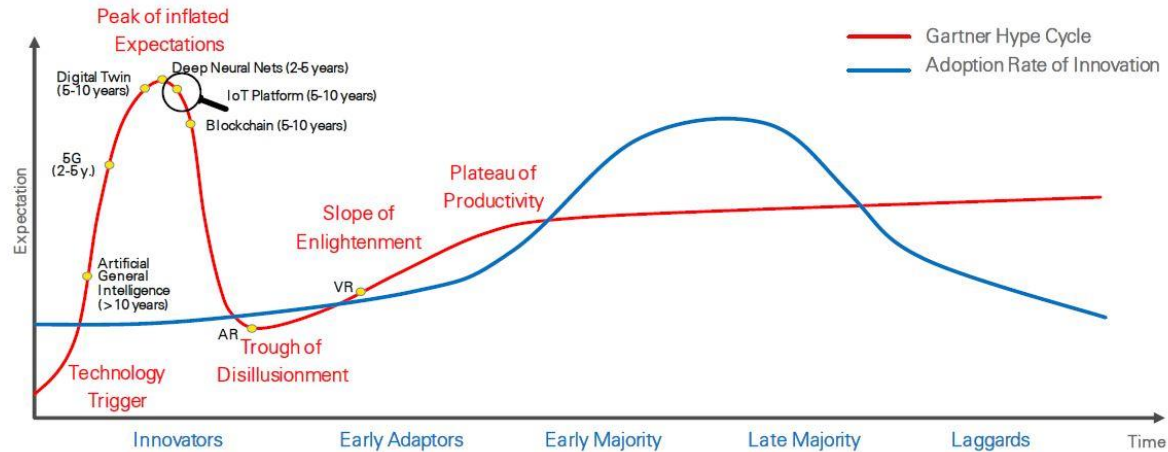
Quelle: EY - bitkom

# Emerging technologies' level of maturity differs and requires companies to rethink their business



Quelle: EY - bitkom

## Emerging technologies require companies to rethink Digital Innovation

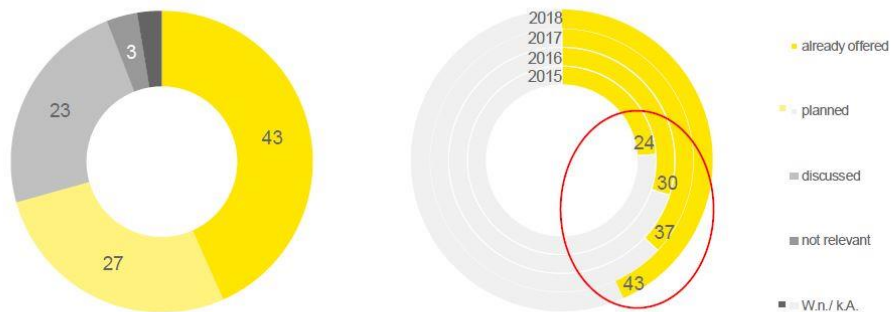


Source: Prof. Dr. Michael J. Capone

## Companies are increasingly offering cloud solutions



„Do you offer cloud-based solutions for your Industrie 4.0 products, respectively do you plan or discuss this?“



Statement (weighted) in percent | base: all interviewed industrial enterprises that offer or plan to offer solutions for Industrie 4.0 (n=138) | Deviations of the sum of 100 percent are due to rounding.

Quelle: EY - bitkom

## Why the explosion of AI?

Explosion of AI = Availability of data + Advances in computing + Packaged Algorithms

Impact of relevant I4.0 technologies on the business model (excerpt)



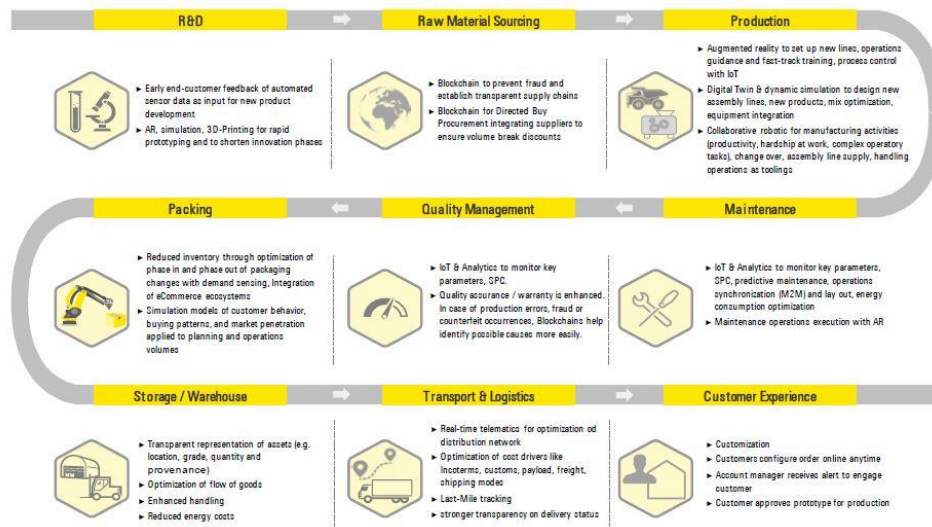
Source: EY & BITKOM study on IoT and Industrie 4.0, 2018, (DE: n=552)



Quelle: EY - bitkom



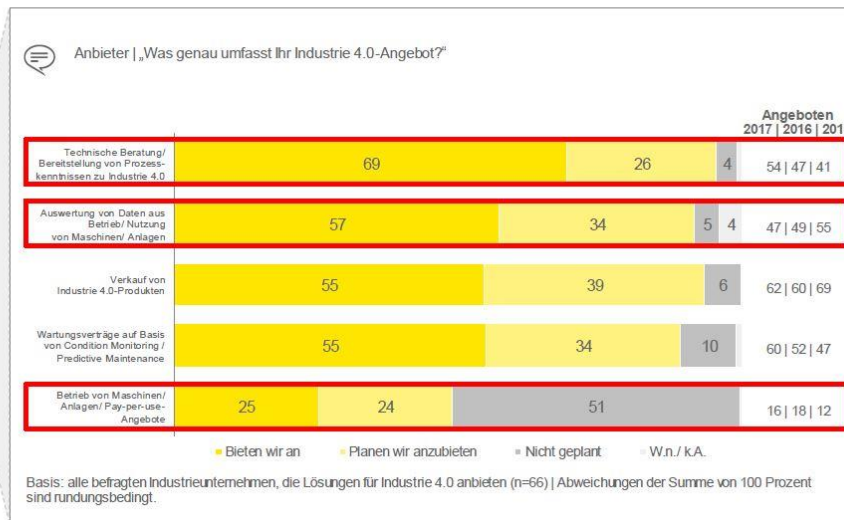
## Throughout the value chain Industrie 4.0 provides solutions resulting in benefits – Example Production



Quelle: EY - bitkom

## Industrie 4.0 Services

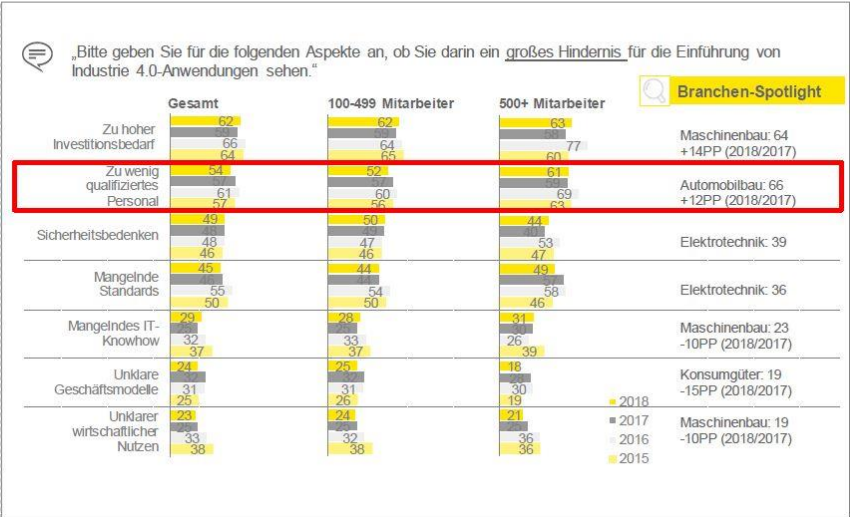
- 1 Technical consultancy and Process Know-How important
- 2 Data analytics for machine usage and operations
- 3 Pay-per-use services become more common



Quelle: EY - bitkom

# Limited availability of qualified personal is still a major obstacle

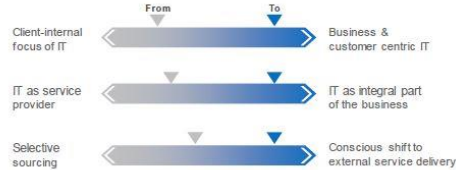
1 Despite decreasing in importance overall, the limited availability of qualified personal is still an important issue.



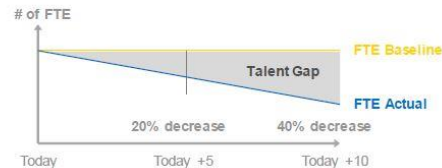
Quelle: EY - bitkom

## A shift of the IT capabilities is necessary to secure operations and enable value creation

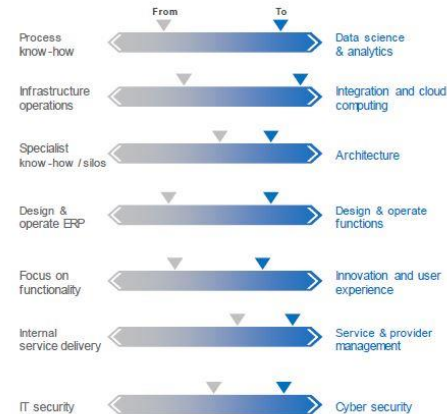
### Shifting role of internal IT



### Demographic development



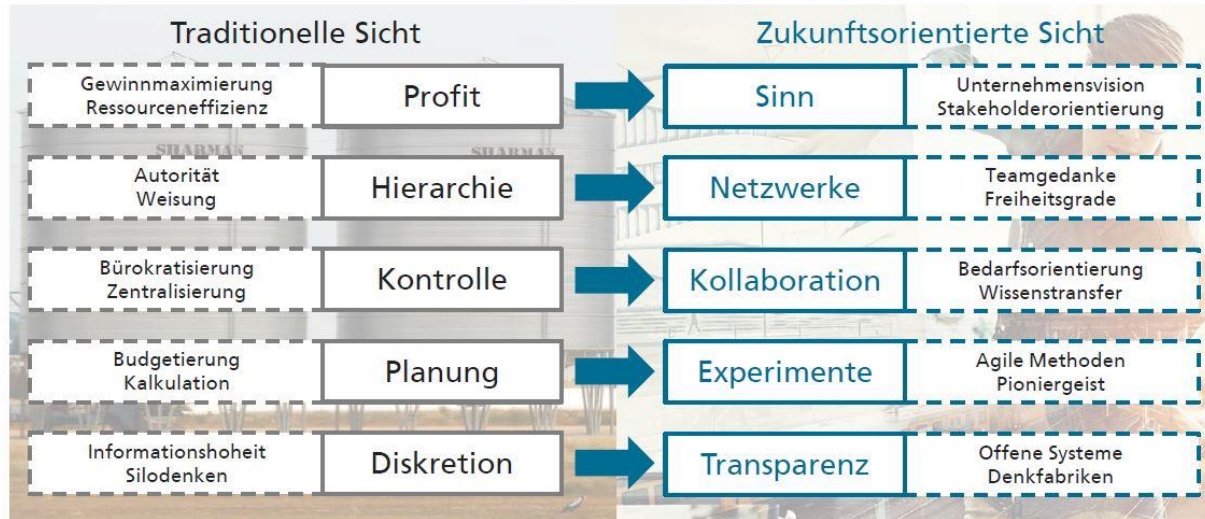
### Required capability shift



Quelle: EY - bitkom

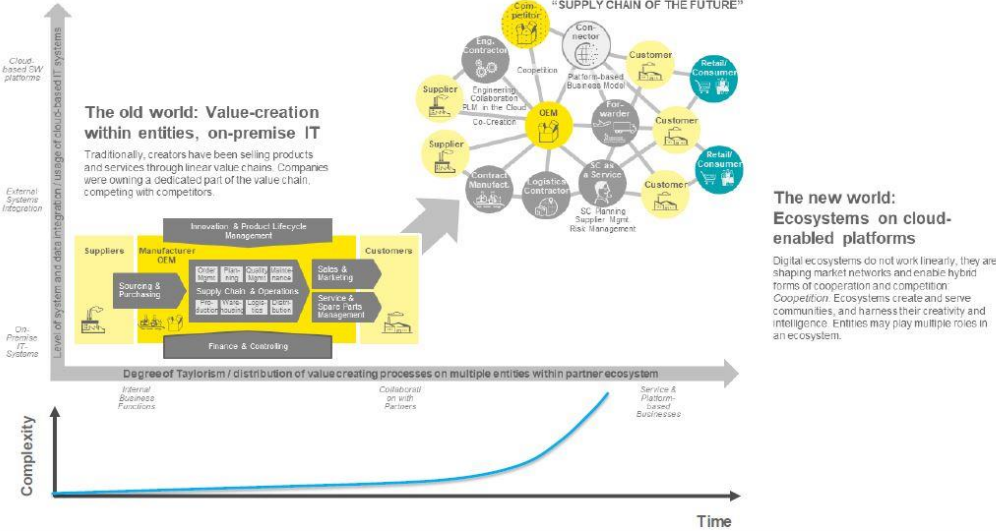
## Neuerfindung der Arbeitswelt

### Aufbrechen veralteter Strukturen und Muster

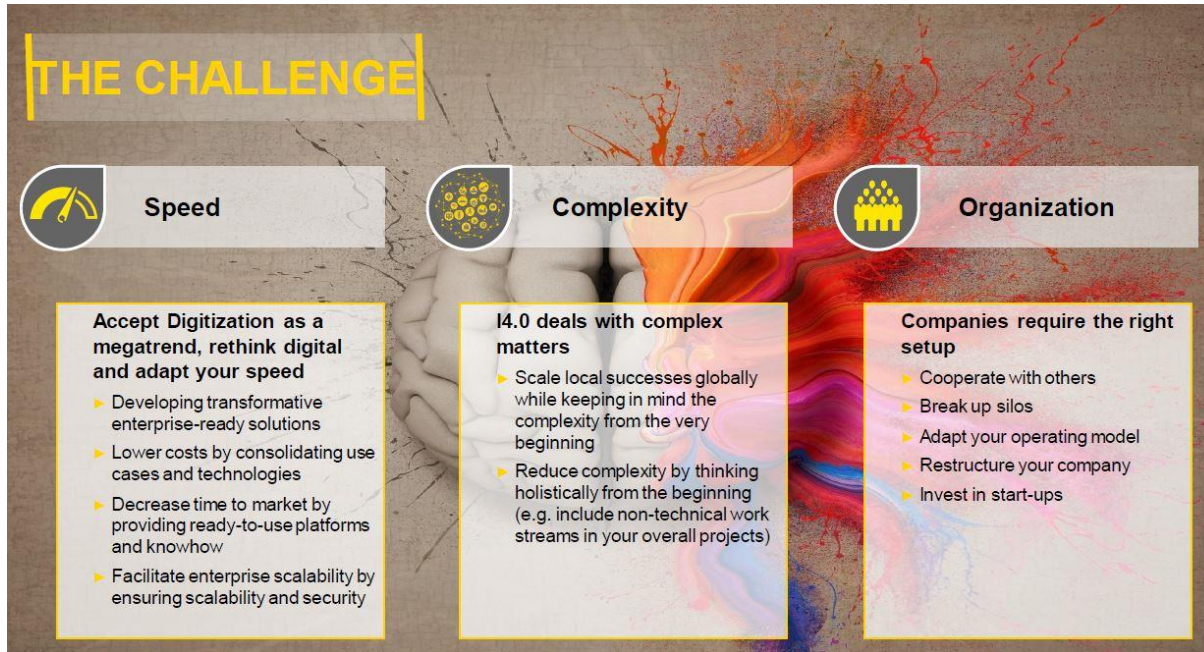


Quelle: Prof. Spath - IAO

# The Value Chain is no longer linear, complex networks build the Supply Chain of the future



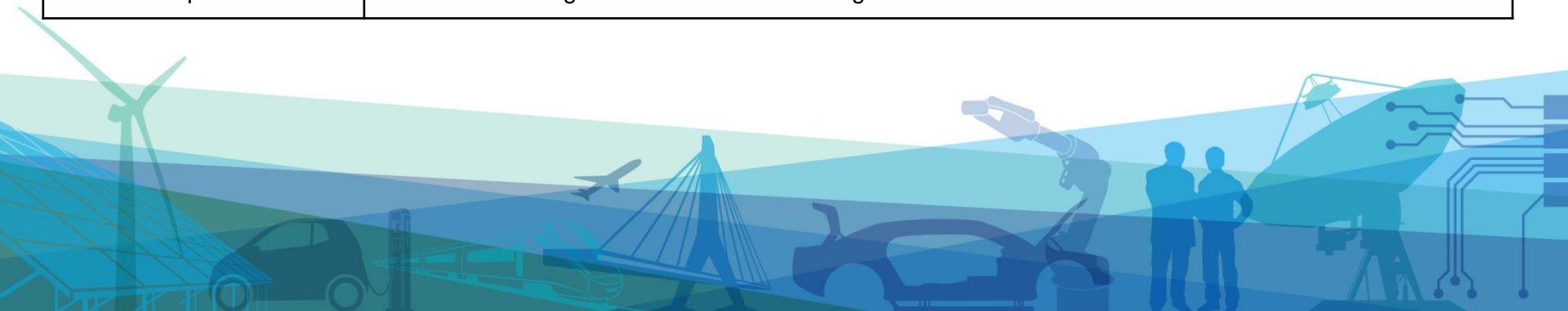




Quelle: EY - bitkom

# Weitere WorkCamp Termine 2019

28. Februar 2019	WorkCamp I
14. März 2019	WorkCamp II
10. April 2019	WorkCamp III
16. Mai 2019	WorkCamp IV
04. Juli 2019	WorkCamp V
22. Juli 2019	WorkCamp VI
23. – 27. September 2019	100 Stunden Morgen – Themenwoche zur digitalen Zukunft und Innovation im Mittelstand





# WorkCamp - Vorstellung



# WorkCamp Maschinelles Lernen

## Common Open Source CS Tools:

- Numpy, SciPy
- Pandas
- TensorFlow, Sklearn
- SQL to Pandas
- NLP / NLTK
- Matplotlib

Often: Working Code First  
Fill In Theory After

## Quantitative

- Prediction: Regression
- ML Classification: Logistic, SVM.. Trees, Forests, Bagging, Boosting,..
- Entropy / Information Topics
- Deep Learning examples, including CCNs
- Correlations
- Markov Processes
- LTI Systems: Fourier, Filters where applicable
- Control Models where applicable

## Building Block Code Samples

- Webscraping
- Stock market live download, simple trading
- Convolutional Neural Networks
- Next Word Predictor, Spell Checking
- Recommendation
- Web Crawler
- Chatbot, E-mail
- Social net interfaces including twitter

# ML Stack

The screenshot shows the KNIME website homepage. At the top left is the KNIME logo with the tagline "Open for Innovation". To the right of the logo are navigation links: "Blog", "Forum", "Events", "Careers", "Contact", a yellow "Download" button, and a search icon. Below these is a horizontal menu with links: "SOFTWARE", "SOLUTIONS", "LEARNING", "PARTNERS", "COMMUNITY", and "ABOUT". The main banner features the text "KNIME Spring Summit 2019" and "March 18 - 22 in Berlin, Germany" above a silhouette of the Berlin skyline. A yellow "Learn More" button is at the bottom left of the banner. To the right of the banner is a "News & Blog" section with three entries: "25 Feb 2019 KNIME and Blackjack", "18 Feb 2019 KNIME Certification Program", and "11 Feb 2019 Movie Recommendations with Spark Collaborative Filtering", followed by a "more news" link. Below the banner are three columns: "... for Developers" with an image of interlocking puzzle pieces and a "Learn More" button; "... for Data Scientists" with an image of lightbulbs and a "Download Now" button; and "... for Decision Makers" with an image of lightbulbs on a network and a "Learn More" button. At the bottom of the "Data Scientists" column is another "Learn More" button. To the right of these columns is an "Events" section with three entries: "13 Feb 2019 - 13 Mar 2019 KNIME Online Course for Advanced Users - February/March 2019", "07 Mar 2019 KNIME Sydney User Group Meetup: Listening to your Data with KNIME, Sydney", and "12 Mar 2019 KNIME Webinar: Practicing Data Science - Asking for Directions in an Artificial Intelligence Project", followed by a "more events" link.

Open for Innovation<sup>®</sup> **KNIME**

Blog Forum Events Careers Contact [Download](#)

[SOFTWARE](#) / [SOLUTIONS](#) / [LEARNING](#) / [PARTNERS](#) / [COMMUNITY](#) / [ABOUT](#)

## KNIME Spring Summit 2019

March 18 - 22 in Berlin, Germany

[Learn More](#)

### News & Blog

**25 Feb 2019**  
KNIME and Blackjack

**18 Feb 2019**  
KNIME Certification Program

**11 Feb 2019**  
Movie Recommendations with Spark  
Collaborative Filtering

[more news](#)

### Events

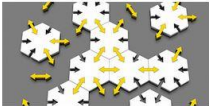
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KNIME Webinar: Practicing Data Science -  
Asking for Directions in an Artificial Intelligence  
Project


[more events](#)

### ... for Developers

  
Build and share... get out in front

[Learn More](#)


### ... for Data Scientists

  
Blend tools and data types seamlessly

[Download Now](#)

[Learn More](#)

### ... for Decision Makers

  
Balancing data scientists and the business

[Learn More](#)

Start with Python as an interface  
Jupyter Notebooks for prototyping

- Python: The interface
- NumPy, SciPy: Working with Arrays
- Pandas: Working in Tables, SQL to Pandas
- Sklearn: ML
- Matplotlib: Visualizing Data
- TensorFlow, Keras: Neural Networks
- SQL to Pandas
- NLP / NLTK: Natural Language
- Spark: For large data sets (GB, TB+)



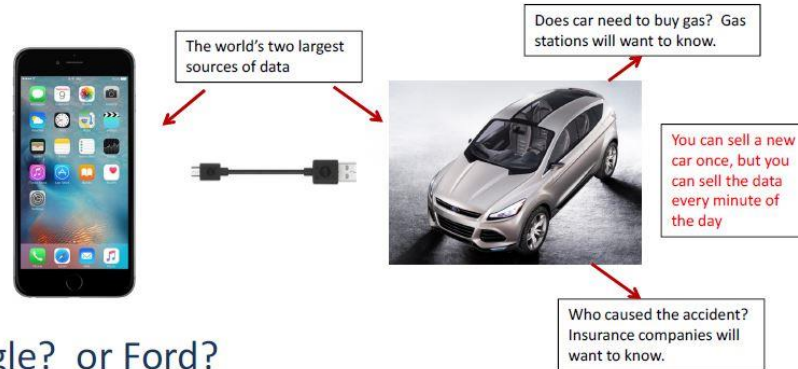
<https://www.youtube.com/watch?v=Q0jGAZAdZqM>

<https://conda.io/docs/user-guide/install/download.html>

## Was wir in diesem Camp betrachten

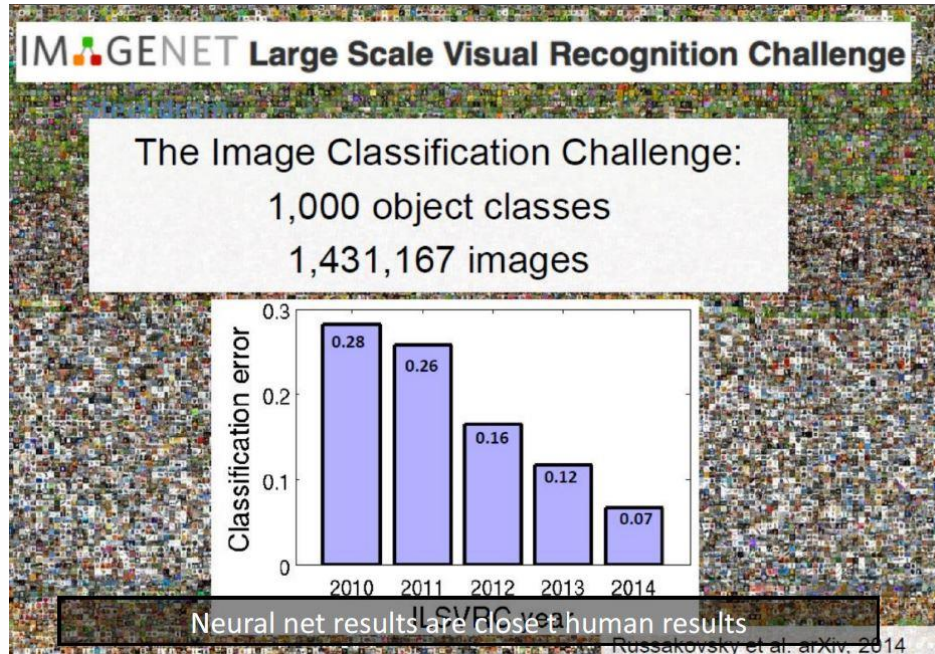
- The **ML stack** most commonly used in creating ML/AI/Data **applications**
- Application and **systems** viewpoint of data and ML
- **Implementation, architecture**, and relevant processes to build real systems
- Statistical, rule based, and **hybrid decision systems**
- Connection with relevant **mathematical foundations** (optimization, entropy, correlation, LTI, prediction, classification)
- Practical insight into **advanced techniques** and tools: (eg. CNNs, NLP, scraping, recurrent networks, etc.)
- System **modeling** for data applications
- **Application talks**: Recommender systems, Blockchain, Spark etc.

## Who Will Control the Automobile?

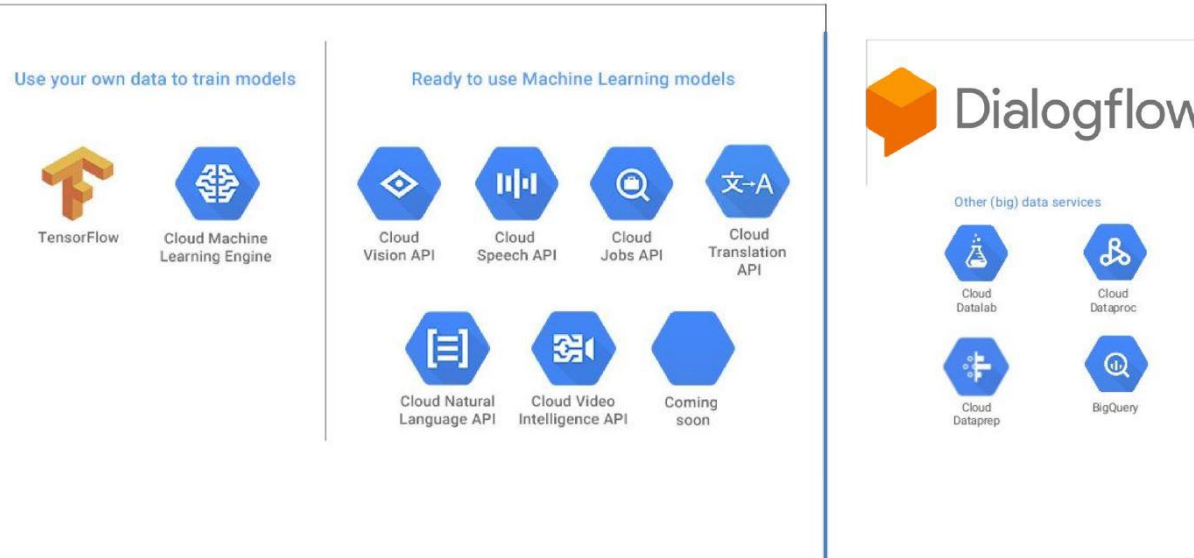


- Google? or Ford?
  - Whoever has the better software and data science team
  - Winner will get the vast (and incredibly valuable) streams of auto data





## API ML Tools





Skills Network Labs

File Edit View Run Kernel Tabs Settings Help

Launcher python-jupyter-grundlagen

Finden Sie hier eine Menge nützlicher Markdown commands: <https://github.com/adam-p/markdown-here/wiki/Markdown-Cheatsheet>

## Code Zellen

Hier können wir interaktiv Python Commands starten

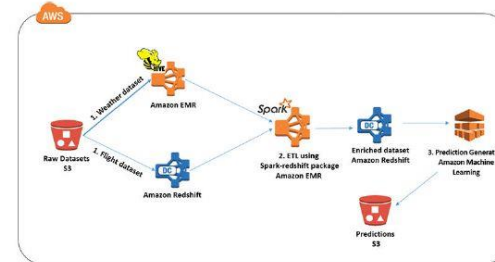
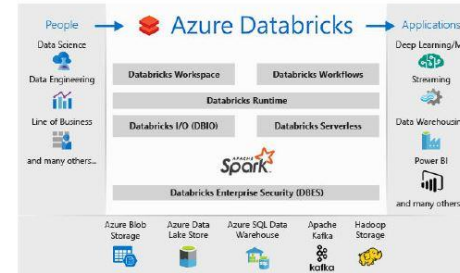
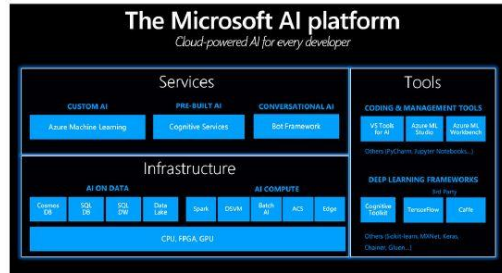
```
[2]: print('Hallo!')
      print('2-te Zeile')
```

Hallo!  
2-te Zeile

```
[ ]: # Kommentar in einer Code Zelle
```

```
[ ]: # Lines evaluated sequentially
      # A cell displays output of last line
      2+2
      3+3
      5+5
```

Kernel



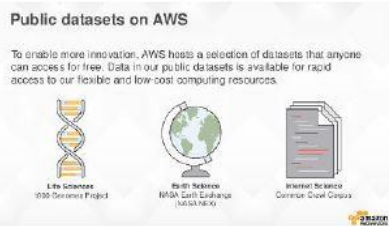
# Woher kommen Daten ?

## Real-life Example: ZestCash

- "All data is credit data"



Your Own Web Site



Public Data Sets  
Stock market, etc.



IOT/Sensors



Other Web Sites

Why: Relevance to  
Organization:

Business Models &  
Strategy, Innovation  
Leadership

What: Technology

Theory, Frameworks  
System Architecture

How: Implementation  
Tools

ML Stack, Code

How: Implementation  
with Innovation  
Behaviors

Process, Agile  
Analytics, Hypothesis,  
Measures

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# 100 Stunden Morgen

Themenwoche zur digitalen Zukunft und Innovation im Mittelstand  
23. bis 27. September 2019

**100 Stunden Programm!**  
**100 Referenten!**



#100hMorgen  
[www.stuttgart.ihk.de/100stundenmorgen](http://www.stuttgart.ihk.de/100stundenmorgen)



Montag

Visionen  
für  
Morgenmacher

Dienstag

Geschäfts-  
modelle für  
Morgenmacher

Mittwoch

Technologien  
für  
Morgenmacher

Donnerstag

Märkte für  
Morgenmacher

Freitag

Digitale  
Kulturen für  
Morgenmacher

08:00 - 17:00 Uhr

23. bis 27. September 2019



## **Eine Woche zum:**

- aktiv zu werden
- tiefer in Themen einsteigen
- sich zu informieren und individuell beraten zulassen
- branchenübergreifend auszutauschen
- neue Kontakte zu knüpfen
- Möglichkeiten der Zusammenarbeit zu finden



Herzlich Willkommen zur Informationsveranstaltung

# WorkCamp – Maschinelles Lernen / Künstliche Intelligenz

Donnerstag, 28. Februar 2019

WLAN-Zugang: IHK-Gast

Download: 3958452

