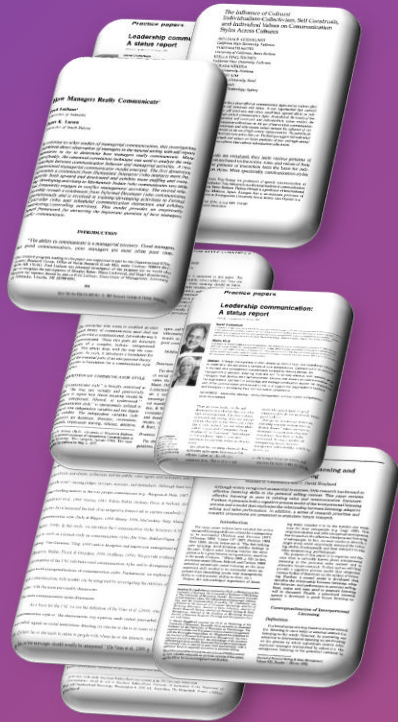WE MAKE AI HUMAN

SO YOU CAN FIND THE ANSWERS
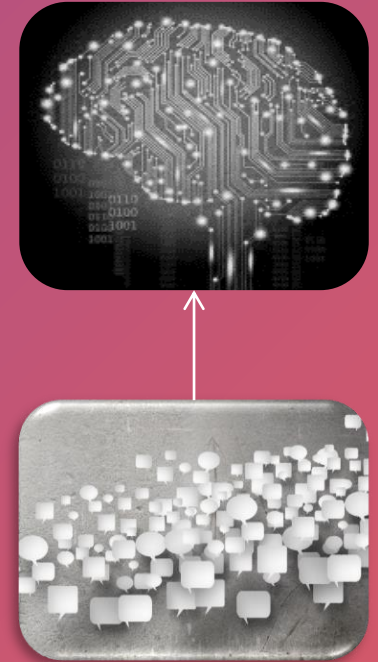
PRECIRE

DEVELOPMENT OF PRECIRE 3.0 - 2 STEPS

1. preliminary study

Psychological knowledge with classical research methods has been used to find out what psychology can measure in communication. This resulted in a model with 29 results (9 main factors).

2. main study

The KI PRECIRE was taught to transform language into the expression of the 29 results of the preliminary study which could be identified. Millions of ratings were used to train and test the technology.

PRECIRE

PRECIRE – PRELIMINARY STUDY
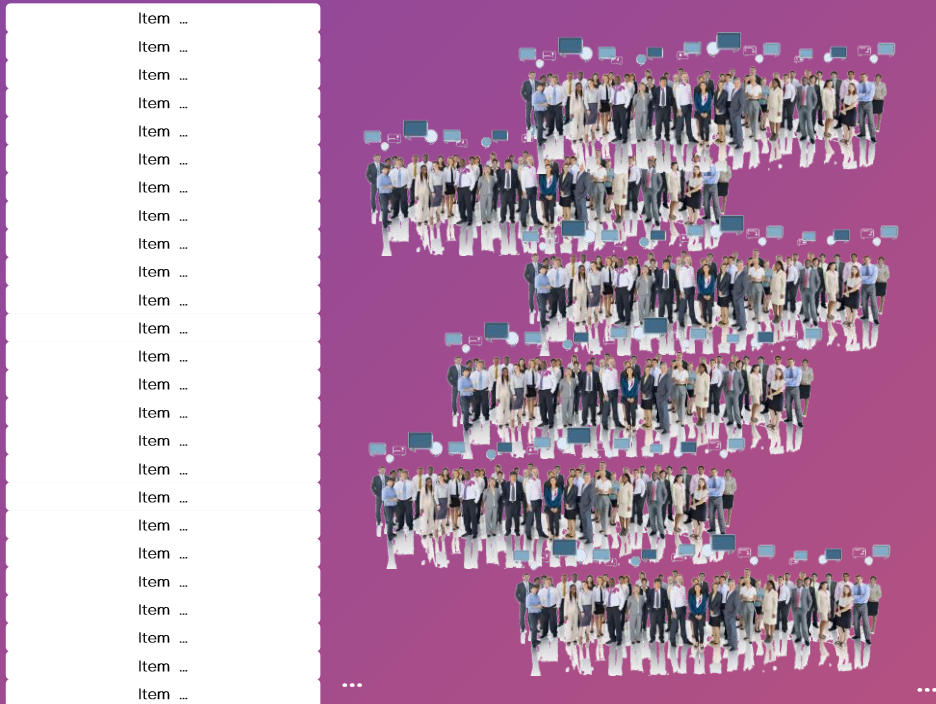
DEFINITION OF THE MODEL

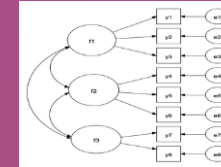# PRELIMINARY STUDY (1) – DEFINITION OF POSSIBLE CONSTRUCTS AND ITEMS

Screening of literature

Communication monitoring

PRECIRE–Experiences

Development and definition of 31 construct hypotheses

For example "supportive" with additional definition of high and low expression:

"The supportive style of communication involves encouraging the concerns of others and thus helping them to develop further. The own well–being is not in the foreground. Who communicates supporting, speaks courage to others and obtains a large helpfulness. Understanding for others is shown".

Definition of 168 items over several preliminary studies for comprehensibility and fit to the construct

For example, for "supportive."

- *"In social situations, I support the concerns of others."*
- *"I often encourage others."*
- *"My communication expresses a willingness to help."*
- *"In social interactions I show great understanding for others."...*

PRECIRE

PRELIMINARY STUDY (2)
WHICH CONSTRUCTS CAN BE MATHEMATICALLY PROVEN?

data collection

data analysis

Training dataset: Implementation of an EFA and update of the construction hypotheses.

Survey of 3477 representatively selected test persons

Training data: Explorative structural equation model for testing hypotheses

Test data: confirmatory factor analysis confirming the model

PRECIRE

VORSTUDIE (3) – PRECIRE MODELL

Cooperative
- Empathic
- Friendly
- Supportive

Venturing
- Positive
- Optimistic
- Visionary

Directing
- Authoritative
- Self-confident
- Composed

Innovative
- Unconventional
- Philosophical

Competitive
- Impulsive
- Aggressive

Independent

Dramatic

Inspiring
- Motivating
- Impressive

Professionell
- Formal
- Structured
- Goal-oriented
- Reliable
- Intellectual

Tabelle 14
Korrelationen und Reliabilitäten der verwendeten Testverfahren

	MW	SD	F1	F2	Professional	Innovative	Competitive	Directing	Dramatic	Inspiring	Independent	Extraversion	Risk	Agreeableness	Intimacy	Conscientiousness	Offenheit für Erfahrungen	Need for Cognition	Power	Internal Control	External Control	Ehrlichkeit-Bescheidenheit	Fear	Emotionality
Venturing	4.84	0.98	0.917																					
Cooperative	5.34	0.82	0.646 (<.001)	0.914																				
Professional	5.25	0.76	0.604 (<.001)	0.526 (<.001)	0.936																			
Innovative	4.41	1.03	0.495 (<.001)	0.315 (<.001)	0.451 (<.001)	0.84																		
Competitive	3.22	1.08	-0.003 (0.887)	-0.254 (<.001)	-0.034 (0.154)	0.35 (<.001)	0.864																	
Directing	4.07	0.91	0.422 (<.001)	0.194 (<.001)	0.48 (<.001)	0.281 (<.001)	-0.025 (0.294)	0.611																
Dramatic	3.20	1.31	0.057 (0.017)	-0.123 (<.001)	-0.124 (<.001)	0.287 (<.001)	0.442 (<.001)	-0.058 (0.016)	0.793															
Inspiring	4.58	1.07	0.746 (<.001)	0.521 (<.001)	0.662 (<.001)	0.583 (<.001)	0.123 (<.001)	0.573 (<.001)	0.093 (<.001)	0.9														
Independent	4.78	1.01	0.104 (<.001)	0.055 (0.022)	0.318 (<.001)	0.039 (0.103)	-0.121 (<.001)	0.359 (<.001)	-0.333 (<.001)	0.168 (<.001)	0.729													
Extraversion	3.23	0.72	0.602 (<.001)	0.378 (<.001)	0.446 (<.001)	0.281 (<.001)	-0.089 (<.001)	0.674 (<.001)	0.013 (0.592)	0.589 (<.001)	0.163 (<.001)	0.841												
Risk	4.15	1.54	0.401 (<.001)	0.122 (<.001)	0.222 (<.001)	0.39 (<.001)	0.204 (<.001)	0.285 (<.001)	0.181 (<.001)	0.386 (<.001)	0.044 (0.068)	0.334 (<.001)	—											
Agreeableness	3.29	0.63	0.346 (<.001)	0.476 (<.001)	0.209 (<.001)	-0.016 (0.497)	-0.56 (<.001)	0.091 (<.001)	-0.189 (<.001)	0.208 (<.001)	0.031 (0.196)	0.312 (<.001)	0.077 (0.001)	0.788										
Intimacy	4.68	0.93	0.424 (<.001)	0.548 (<.001)	0.292 (<.001)	0.207 (<.001)	-0.072 (0.003)	0.208 (<.001)	-0.094 (<.001)	0.352 (<.001)	0.044 (0.063)	0.294 (<.001)	0.09 (<.001)	0.224 (<.001)	0.69									
Gewissenhaftigkeit	3.77	0.55	0.258 (<.001)	0.31 (<.001)	0.507 (<.001)	0.04 (0.098)	-0.301 (<.001)	0.355 (<.001)	-0.328 (<.001)	0.25 (<.001)	0.281 (<.001)	0.306 (<.001)	-0.02 (0.41)	0.199 (<.001)	0.227 (<.001)	0.753								
Offenheit für Erfahrungen	3.39	0.68	0.305 (<.001)	0.291 (<.001)	0.307 (<.001)	0.537 (<.001)	-0.007 (0.762)	0.23 (<.001)	0.024 (0.307)	0.332 (<.001)	0.05 (0.035)	0.215 (<.001)	0.245 (<.001)	0.131 (<.001)	0.208 (<.001)	0.197 (<.001)	0.786							
Need for Cognition	4.21	1.06	0.253 (<.001)	0.187 (<.001)	0.28 (<.001)	0.345 (<.001)	-0.042 (0.077)	0.261 (<.001)	-0.056 (0.019)	0.245 (<.001)	0.139 (<.001)	0.264 (<.001)	0.26 (<.001)	0.118 (<.001)	0.142 (<.001)	0.301 (<.001)	0.407 (<.001)	0.469						
Power	3.05	1.02	0.304 (<.001)	0.046 (0.053)	0.263 (<.001)	0.415 (<.001)	0.45 (<.001)	0.265 (<.001)	0.295 (<.001)	0.419 (<.001)	-0.13 (<.001)	0.245 (<.001)	0.324 (<.001)	-0.219 (<.001)	0.122 (<.001)	-0.026 (0.281)	0.152 (<.001)	0.064 (0.008)	0.698					
Internal L. o. Control	3.69	0.92	0.379 (<.001)	0.206 (<.001)	0.386 (<.001)	0.194 (<.001)	0.041 (0.084)	0.317 (<.001)	-0.027 (0.257)	0.37 (<.001)	0.21 (<.001)	0.343 (<.001)	0.268 (<.001)	0.071 (0.003)	0.152 (<.001)	0.232 (<.001)	0.133 (<.001)	0.182 (<.001)	0.196 (<.001)	.438				
External L. o. Control	2.26	0.92	-0.059 (0.014)	-0.056 (0.018)	-0.093 (<.001)	0.114 (<.001)	0.263 (<.001)	-0.22 (<.001)	0.205 (<.001)	-0.044 (0.069)	-0.272 (<.001)	-0.184 (<.001)	0.018 (0.448)	-0.172 (<.001)	-0.051 (0.032)	-0.266 (<.001)	-0.028 (0.249)	-0.151 (<.001)	0.195 (<.001)	-0.113 (<.001)	.513			
Ehrlichkeit-Bescheidenheit	3.66	0.62	-0.024 (0.322)	0.19 (<.001)	0.062 (0.009)	-0.214 (<.001)	-0.383 (<.001)	0 (0.995)	-0.363 (<.001)	-0.12 (<.001)	0.282 (<.001)	0.047 (0.048)	-0.18 (<.001)	0.249 (<.001)	0.141 (<.001)	0.297 (<.001)	0 (0.986)	0.127 (<.001)	-0.428 (<.001)	0.042 (0.081)	-0.28 (<.001)	0.739		
Fear	3.57	0.19	-0.124 (<.001)	-0.007 (0.782)	-0.169 (<.001)	0.06 (0.012)	0.248 (<.001)	-0.372 (<.001)	0.162 (<.001)	-0.126 (<.001)	-0.355 (<.001)	-0.418 (<.001)	-0.111 (<.001)	-0.277 (<.001)	0.089 (<.001)	-0.21 (<.001)	-0.051 (0.033)	-0.17 (<.001)	0.196 (<.001)	-0.159 (<.001)	0.303 (<.001)	-0.216 (<.001)	0.768	
Emotionalität	3.27	0.65	-0.059 (0.013)	0.204 (<.001)	-0.139 (<.001)	-0.063 (0.008)	0.076 (0.002)	-0.247 (<.001)	0.038 (0.112)	-0.084 (<.001)	-0.249 (<.001)	-0.227 (<.001)	-0.266 (<.001)	-0.132 (<.001)	0.321 (<.001)	-0.09 (0.02)	-0.056 (0.188)	-0.177 (<.001)	0.032 (0.188)	-0.149 (<.001)	0.191 (<.001)	-0.038 (0.108)	0.527 (<.001)	0.744

Anmerkung: Korrelationen der Skalenergebnisse alle verwendeten Testverfahren untereinander, berechnet am Testdatensatz (n=1743). In der Diagonale sind die Alpha-Reliabilitäten dargestellt. Die Alpha-Reliabilitäten wurden berechnet, wenn eine Skala mehr als 2 Items aufwies.

PRECIRE – MAIN STUDY

TECHNOLOGY TRAINING AND TESTING

MAIN STUDY (2) – DATA COLLECTION TRAINING/DEV/TEST DATASET

To generate the training, dev and test data set, participants evaluated a text component with regard to the developed items on a 7er Likert scale (analogous to the preliminary study). (Announced) attention items (e.g. "Please press "agree" here.") were integrated and sophisticated systems were developed with which people could be reliably identified who had not clicked "honestly" or randomly, e.g. on rows, deviation comparisons, patterns and response time.

Text Impression Analysis

> Entertainment day and night, the action goes in this vibrant city. (...)
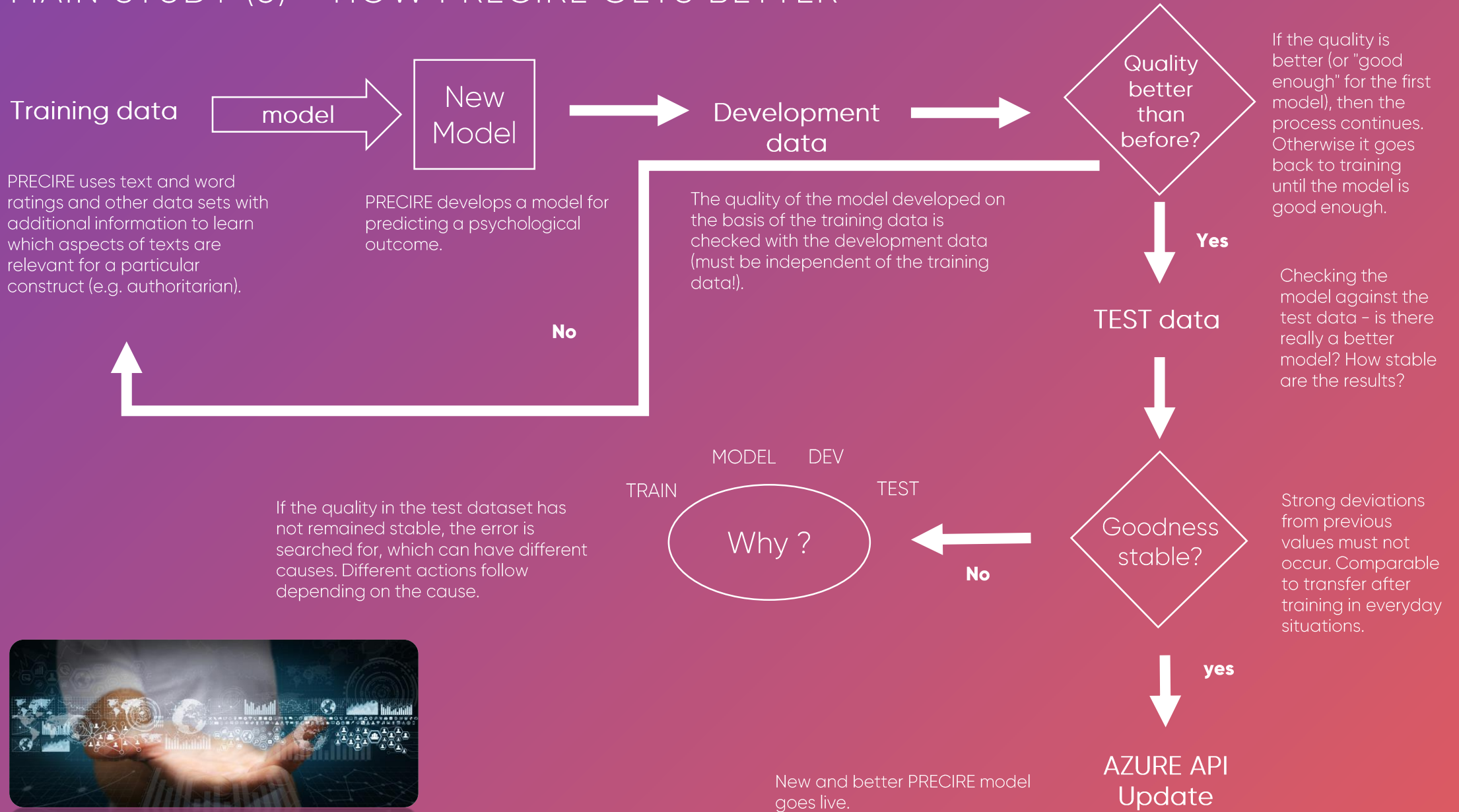
➤ **The text is exciting.**

Strongly Disagree	Disagree	Slightly Disagree	Neither	Slightly Agree	Agree	Strongly Agree

OVER 24 MILLION RATINGS

OF MORE THAN 16.000 PEOPLE

MAIN STUDY (3) – HOW PRECIRE GETS BETTER

Training data → model → **New Model** → **Development data** → **Quality better than before?**

PRECIRE uses text and word ratings and other data sets with additional information to learn which aspects of texts are relevant for a particular construct (e.g. authoritarian).

PRECIRE develops a model for predicting a psychological outcome.

The quality of the model developed on the basis of the training data is checked with the development data (must be independent of the training data!).

If the quality is better (or "good enough" for the first model), then the process continues. Otherwise it goes back to training until the model is good enough.

No

Yes

TEST data

Checking the model against the test data – is there really a better model? How stable are the results?

MODEL   DEV

TRAIN   TEST

Why ?

If the quality in the test dataset has not remained stable, the error is searched for, which can have different causes. Different actions follow depending on the cause.

No

Goodness stable?

Strong deviations from previous values must not occur. Comparable to transfer after training in everyday situations.

yes

AZURE API Update

New and better PRECIRE model goes live.

Training data

model → **New Modell** → **Development data** → **Quality better than before?**

The quality of the behaviour in the role play is evaluated. Was the behaviour good enough? Was it better than before?

The manager goes to a training course on conflict management. She deals with content, learns new approaches, theories and procedures as well as possible actions to deal with conflicts in everyday life.

From this, the manager develops a new behavioural model for himself and an idea of how he should behave in the next conflict situation.

The quality of the newly developed behavioural approach is tested in a role play at the end of the training.

Yes

Conflicts in everyday life are decisive for the quality of the new behaviour, the resolution of which is hypothetically observed and evaluated by the coach.

No

TEST data

MODEL DEV

TRAIN **why ?** TEST

Goodness stable?

If the transfer to everyday life has not worked, there may be various reasons for this. If the cause is found, the next actions can be derived.

No

If the manager has also made it in everyday life, then the new behavior model is probably better.

Yes

New and better behavioural model is included in the natural behavioural repertoire and can be called up there.

Adoption into the behavioural repertoire

MAIN STUDY (4) – MODEL TRAINING

The training of an AI model is comparable to the learning of a human being.

For example, when a person makes a decision regarding a particular behavior in a conflict situation, that decision is the result of all his life experience, his experience with that specific situation, and his resulting personal behavioral tendencies.

For example, the person in front of him, the context of the situation, possible consequences and statements etc. are included in the decision.

The more experience you have with different conflict situations, the more confident your decisions regarding behaviour in these situations will be.

The person takes part in conflict management training as part of the training. In this training the person first deals with different behavioural alternatives, tries out different behaviours, is taught techniques or observes people who already deal particularly well with conflicts. From this she builds her own behavioural model for all possible conflict situations.

If the KI PRECIRE makes a decision regarding the expression of a special text or a language sample (e.g. authoritarian), then this decision is based on the sum of all previous experiences of the technology. Machine Learners teach the technology by showing it, for example, texts or language that is very authoritarian and language that is not at all authoritarian. The technology learns which words, word combinations, sentence positions etc. lead to which result in which situation. Translated with www.DeepL.com/Translator

The same applies to learning PRECIRE. Therefore the technology is shown as much experience as possible with different texts from different people.

During the training PRECIRE also builds a model of a construct, learns from the available data and develops a model in which the success is very likely, since the prediction could already be tested on many different data. The person who learns conflict management cannot do this because he or she is not constantly in real conflict situations and usually does not get such clear feedback (right – wrong) about the behaviour.

MAIN STUDY (5) - SELECTION OF THE BEST MODEL ON THE DEV-DATENSET

The prediction in the AI model is comparable to the behavioral decision in humans.

The conflict management training seems to be completed, the person has an idea of how to behave in the next conflict situation.

Since they are in a training programme, they have the opportunity to try out the behaviour in a role play.

This allows her to check whether the new behaviour works.

If the behavioural model has worked, then there is greater certainty that it will work in the transfer, i.e. in everyday work and in the next real conflict situation.

If the behavioural model has not worked well, or not better than the previous one, it goes back to training, the participant needs new or different information to develop a better model.

PRECIRE has developed a new model that has worked well with the training data and has a high level of confidence that it will continue to work.

The new model is then tested on a data set that is independent of the training data set.

This is used to test whether the model also works with new data.

If the PRECIRE model has worked better, go to the test data set. In contrast to human training, training, dev and test are very similar, which increases the probability that the model will work stable in all situations.

If the model hasn't worked better, it goes back to training. The model is then trained further with new or different data sets.

The test of an AI model is comparable to the transfer of what has been learned into everyday human life.

After the learned behavioural model has worked well in role play, the trainee goes into everyday life.

In the next conflict situation he applies the learned behavior model (according to the situation).

In this way he can check whether the transfer of the behavioural model into everyday life also works.

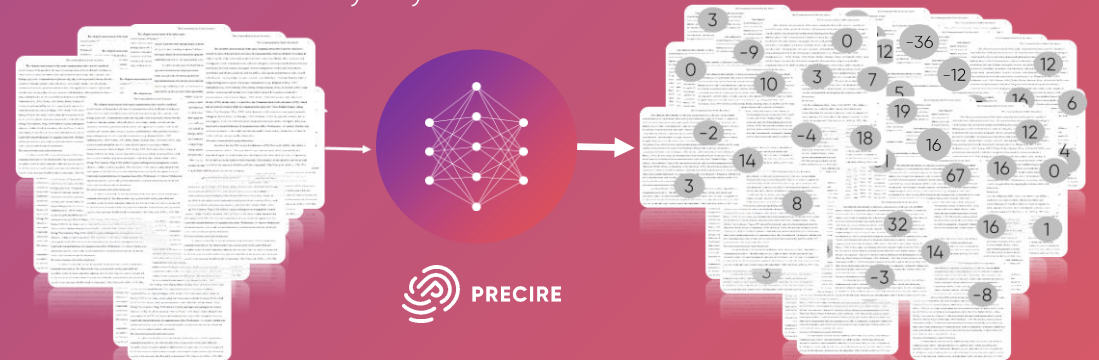Repeatedly works well in everyday life.

Works only sometimes.

Cause search

Does not work.

If the behavioural model also functions in everyday situations, it is adopted into the behavioural repertoire.

After a good/better result for the model was available on the DEV data, the model is tested on a new, completely independent data set.

This is used to test whether the model also works with completely independent test data. In contrast to the transfer in humans, the learning phase and model selection in PRECIRE were almost identical to the "everyday transfer".
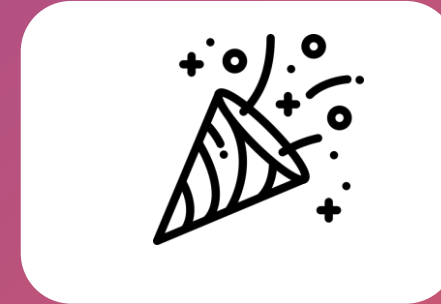
PRECIRE

Very simplifying: If the results with the test data are similar to those in the Dev data set, the model is switched live.

New, successful behaviour learned!

New, good model released

PSYCHOLOGY FOR EVERYONE

- PRECIRE is based on the worldwide biggest and constantly growing study linking psychology and AI …
  - …with more than 24 Million ratings …
  - … from more than 16 Thousand raters …
  - … using a model with more than 110 Million parameters …
  - … which has already analyzed more than 4 Billion words.

- Understanding what motivates people and enabling you to continuously improve
  - → personally
  - → your processes
  - → your organization

COMMUNICATION IS CULTURE

PRECIRE

PRECIRE – WHAT CAN TECHNOLOGY DO?

EXAMPLES FOR THE CONNECTION WITH KPI'S (PEOPLE)

Evaluation Personnel Development – Example Project

WHO?

A total of n = 17 board members trained with the help of a learning platform and with the feedback from PRECIRE.

WHAT?

The aim of the PE measure was to optimise management communication. The main focus here was on the communicative effects relevant to the company and its success. The starting point was the feedback from PRECIRE before the training, with the help of which the board members were able to identify their personal areas of development and specifically train their language. After the training phase, another PRECIRE test took place to determine the success of the training.

As soon as the PE measure is rolled out company-wide, the overriding goal is to increase organizational agility through the development of individual leadership behavior.

PROCESS

feedback discussion
– Integration of the results into everyday life
– joint development of the training fields
most conducive to development

attendanc

retest

Access
code

Agreement
Feedback
discussion

Training (Platform)
Accompanying weekly
talks (5 minutes)

feedback
conversation

PRECIRE

Evaluation of personnel development – derivations

The results show that the participants have clearly and significantly improved their communication skills in a short period of time.

- ✓ Through the awareness of the individually achieved effect and the adaptation of certain communicative behaviour patterns, rapid and measurable progress is possible.

- ✓ For a long-term success and the sustainability of the learning transfer into the everyday life the training should be continued.
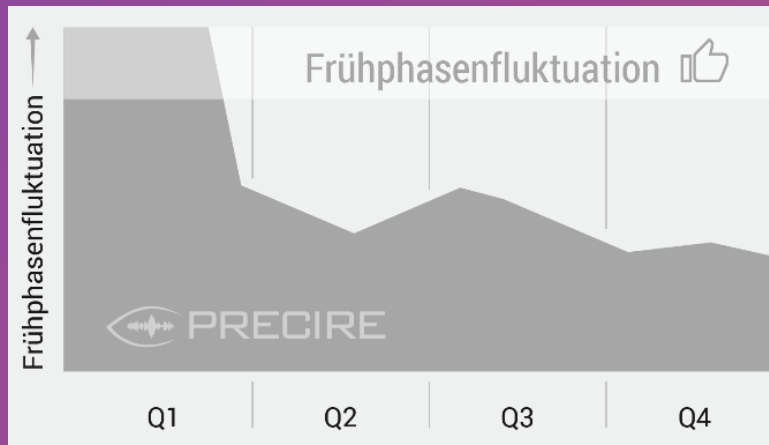
The digital, modern and novel form of further development has been very well received!

- ✓ The advantages of self-directed learning, the independence of place and time as well as the personal individualisation of the process are particularly positively evaluated.

- ✓ Thus, the challenging target group of board members could be well picked up and enthused for the project.
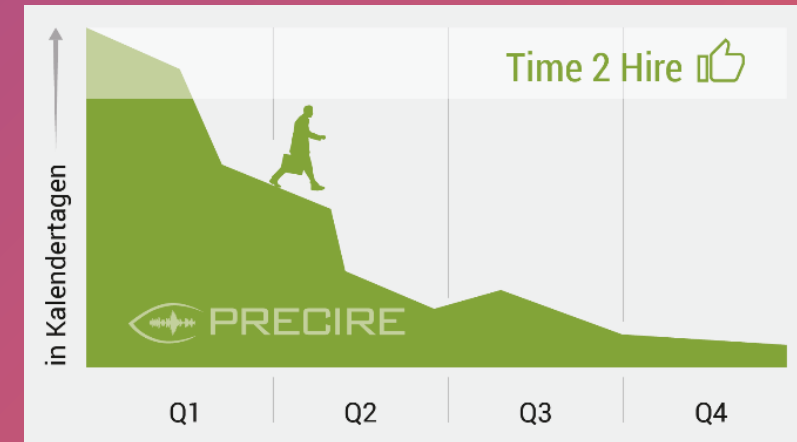
PRECIRE

KPI improvement with PRECIRE results

Use of PRECIRE for pre-screening candidates in order to obtain a holistic impression in addition to the examination of qualifications through CV analysis, an intelligence test and getting to know each other in a personal interview.

Since the use of the technology, **early phase fluctuation has been significantly reduced (by 45%)**. The reduction in early phase fluctuation has had a **positive effect on overall fluctuation (decreased by approx. 19%)**.

At the same time, **time to hire** has decreased due to more efficient testing. The low threshold for participation, the fast feedback and the reduction of the pre-assessment effort have led to a **reduction of process costs by 35%.**

Relation to key performance indicators

In addition to the positive influence on business ratios, the PRECIRE results show significant correlations with key performance indicators (KPIs) in sales.

Big profit and inspiring communication

PRECIRE Ergebnis		GP 1. Monat n. PZ
Inspirierend	Spearman's rho	0.198
	p-value	0.011

Spearman-Brown Rangkorrelation zwischen der Kennzahl "Gross-Profil nach der Probezeit" und dem relevanten PRECIRE Ergebnis "Inspiring".

Sales result at the end of 2015 and PRECIRE results

PRECIRE Ergebnis		Erg. Dez.2015
Autoritär	Spearman's rho	0.229
	p-value	0.007
Zielorientiert	Spearman's rho	0.174
	p-value	0.040
Inspirierend	Spearman's rho	0.245
	p-value	0.004
Motivierend	Spearman's rho	0.242
	p-value	0.004

Spearman-Brown Rangkorrelation zwischen dem Vertriebsergebnis Ende 2015 und relevanten PRECIRE-Ergebnissen.

"Result" and Precire Results

PRECIRE Ergebnis		Result
Dramatisierend	Spearman's rho	0.250
	p-value	0.011
Formell	Spearman's rho	–0.230
	p-value	0.020
Zielorientiert	Spearman's rho	0.235
	p-value	0.018
Impulsiv	Spearman's rho	0.256
	p-value	0.010
Motivierend	Spearman's rho	0.252
	p-value	0.011
Philosophisch	Spearman's rho	–0.210
	p-value	0.035

Spearman-Brown Rangkorrelation zwischen der Kennzahl "Result" (Gesamtergebnis der Bewertung aus Kennzahlen und FK-Bewertung) und relevanten PRECIRE-Ergebnissen.

Overall, the interrelationships can be described as moderate. It has to be considered that sales results are influenced not only by communication and customer interaction, but also, for example, by the region in which the sales staff are active.

PRECIRE

Interrelationships with executive evaluations

Evaluations from live operations with n= 93 employees in sales (rating on a scale of 1-6, inverted) also show significant correlations between the PRECIRE results and evaluations by managers. The performance in "sales", the "ability to work in a team" and the leadership potential of the respective employee were evaluated.

Success ratio "Sales"

PRECIRE Ergebnis		Vertrieb
Lenkend	Spearman's rho	0.266
	p-value	0.010
Autorität	Spearman's rho	0.336
	p-value	<.001
Inspirierend	Spearman's rho	0.217
	p-value	0.037
Beeindruckend	Spearman's rho	0.248
	p-value	0.016
Optimistisch	Spearman's rho	0.209
	p-value	0.045

Spearman-Brown Rangkorrelation zwischen der Kennzahl „Vertrieb" (Notenskala 1–6, invertiert) und relevanten PRECIRE-Ergebnissen bei n=93 VertrieblerInnen.

Key performance indicator "ability to work in a team".

PRECIRE Ergebnis		Team-fähigkeit
Kooperativ	Spearman's rho	0.204
	p-value	0.050
Unabhängig	Spearman's rho	-0.228
	p-value	0.028

Spearman-Brown Rangkorrelation zwischen der Kennzahl „Vertrieb" (Notenskala 1–6, invertiert) und relevanten PRECIRE-Ergebnissen bei n=93 VertrieblerInnen.

Key performance indicator "Leadership potential

PRECIRE Ergebnis		Führungs-potenzial
Lenkend	Spearman's rho	0.218
	p-value	0.036
Optimistisch	Spearman's rho	0.240
	p-value	0.021
Selbstbewusst	Spearman's rho	0.241
	p-value	0.020

Spearman-Brown Rangkorrelation zwischen der Kennzahl „Vertrieb" (Notenskala 1–6, invertiert) und relevanten PRECIRE-Ergebnissen bei n=93 VertrieblerInnen.

PRECIRE