

Challenges to Accreditation Bodies due to recent developments in IT

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Introduction

- Norman Brunner
 - general manager of the Austrian National Accreditation Body „Akkreditierung Austria“ (AA), based in the Federal Ministry of Economy since 2011, worked in industry before
- Akkreditierung Austria
 - has about 490 accreditations with 650 accredited sites => lower medium size AB in EA
 - specifics: Akkreditierung Austria staff is only present in about 5% of assessments (10 file-managers / internal assessors) => AA heavily relies on external, contracted assessors

Introduction of topic and methodology

- AB staff is used to talk on issues based on objective evidences, Dominique Ferrand and I decided to confront you with something different, a mid-term view from a more strategic perspective with the focus to instill discussion / thought
- more focused on AB issues - most probably applicable for CABs as well)

Recent developments in IT

- Deep Learning, AI Act, ChatGPT
- Why is AI such a widespread topic in the last year?

Is the current interest in AI a Hype or a trend

- Essential to figure out, if current interest in AI is a **Hype** or a **Trend**
- Artificial Intelligence (AI) is used in industry since more than 20 years (mainly in the production and quality control area), N.Brunner started to implement pre-forms of AI in his last positions in industry
- in order to estimate possible developments the basic concepts need to be known

Basic concepts 1 – Deep Learning

- Concept of deep learning established 15-20 years ago
 - machine-learning inspired by the structure and functioning of the human brain
 - large artificial neuronal networks
 - an artificial neuron can be considered as a simple computer
 - many specific functions (Activation functions, loss function, Tensor, Gradient decent, back-and forward propagation, Epoch, over- and underfitting, batch normalization, convolutional neural network, Generative adversarial network, Transfer Learning...)
 - parallelisation of processes

Basic concepts 2

- The current AI tools were developed from Deep Learning, so Deep Learning concepts were the basis to the current main AI areas
 - a. Large Language Models (LLMs)
 - b. generative AI

Basic concepts 3 - Large Language Models (LLMs)

- LLMs are a sub-division of generative AI
- trying to learn, how humans communicate
- trained with very large data sets („whole public internet“),
- can be trained for different fields (domain specific)

Basic concepts 4 - Large Language Models (LLMs) – use-cases

text classification (no labelling required anymore)

question answering

summarization

text generation

Basic concepts 5 - Large Language Models (LLMs) – functionality

- „just“ calculating the probability of the next word in a sequence (with billions of parameters), general purpose must be known to communicate with humans (mimicing human language)

Example: Austria is a landlocked - country – located – in – Central Europe

- output depends strongly on the input, high variability (credibility?, validation?, trustworthyness?)
- only by finetuning (training with specific content and guidance) the output can get more reliable fo specific use-cases

Basic concepts 6 - Generative AI

- a form of machine learning that is able to produce text, video, images, and other types of content (in a way understandable for humans)

ChatGPT (DALL-E, Bard, Ernie Bot, LLaMA)

- ChatGPT is „just“ a text-to-text based application/human interface = to make the technology accessible and understandable, thus based on LLM and generative AI),
 - extremely rapid development => with every new version capabilities are rapidly increasing and probability of assumed results is improving
 - only possible due to the recent development and availability of processors with parallel computing capabilities in a higher quantity => this is a major reason why ChatGPT (or similar application) only became available to the public about a year ago

Examples of already available AI applications

- Summarization (Call Centers): summary of customer support conversation logs - domain specific documentation (financial reporting, analyst articles), Social Media, Trends Summarization
- Code Generation: Convert natural language to SQL (or vice versa) for telemetry data - Code Documentation
- Semantic search: search reviews for a specific product/service
- Generation of content: personalised UI for website, automatic response to customer inquiries

Hype or trend? - Consequences

- **Trend, here to stay**
 - how will AI influence our lives/work in the medium/longer term? (fears, expectations, often based on insufficient understanding of the AI principles & due to rapid distribution of opinion via Internet)
 - comparison with Internet - insecurities were comparable => changed the way we communicate (letters are still there, even though used less, many new use-cases)
- => we must find a form of collaboration between humans and AI, that allows humans to perform more creative tasks with higher reliability of output in shorter times on fact-based content generated by AIs

Use-cases in Conformity Assessment 1

- Can I use Chat GPT on my data (f.e. on top of my sharepoint, E-Mail,) ?
 - for summarization; democratize fast access to valuable data in an organisation (example) – „Ask your data“ – Enterprise fact-based question and answering
- Auditing / Assesment:
 - example: what were the most critical control points with the customer X => manually click through many documents => all such documents would need to be indexed, prepare a comparative table

Use-cases in Conformity Assessment 2

Cognitive Search (Azure Open AI) => answer - no need to look in the documents, including reference where to find it

=> not replacing humans but enabling humans to be more efficient

- recorded as text, ev. as well per audio (less time for writing) => analyzed to create a summary report for most important findings

no database behind the BI => as audio
can go even into sentiments

(danger for ABs?)

Is there really a need for ABs to adapt

- Is there a chance not to adapt?
 - similar situation as with the COVID-19 pandemic (ABs hardly used remote tools / assessment techniques) but were forced to adapt in order to continue to fulfill their obligations
 - ABs need to adapt to keep the trust in the current accreditation system (as attestation of competence) - if ABs donot adapt they might be replaced by more flexible, advanced systems
- => ABs will almost be forced to comply

AI application in Conformity assessment - trend-setting?

- NO, Conformity Assessment is a follower (already today)
 - Certification Bodies start to consider use of AI to get output from their collected data, summarization
 - ABs are even less developed (limited resources)

Challenges with AI for ABs, CBs - technical

- confidentiality of data vs. continued improvement by learning by an AI (limiting AI development)
- credibility /reliability of AI generated information
(wrong answers come from hallucination – like in humans)
there are several ways to try to overcome this problem (prompt engineering => provide more examples => fine-tuning by AI experts)
=> important to check results (those usually are clearly referenced in the AI answer) to rest assured, that everything is as unbiased as possible (Validation)

Challenges with AI for ABs, CBs - general

human factors:

- change-processes always require a lot of personal interaction to convince persons
- availability of resources (both financial and competence-wise)

as in Conformity Assessment there is not so much money involved (ev. with exception of Management CBs) the AI industry is not focusing their development in this field

extremely difficult to find competent experts

Challenges - Status quo of IT use in CABs & ABs

- different development status of accredited CABs as concerns the use of advanced IT tools (not to speak about use of AI tools, which is almost non-existing)
- as accreditation is based on applications, the responses of ABs to the requirements of such different CABs has to orient itself to the lesser advanced CABs status (and AB internal optimisation) - use of internal AB data & for assessors independent on the CABs development status in AI

=> ABs are not on the forefront of change, innovation and adaptation, but followers

Challenges - Required change in behaviour from ABs ?

- as independent of the size all ABs have to fulfill the same requirements it is astonishing to note,
 - relatively small amount of persons are working in accreditation
 - the splitted appearance and ways of working of ABs
- ⇒ N.Brunner raised the issue of real collaboration instead of information exchanges already in 2012 in EA => little response (almost unchanged until even today)

Strategic plan (idea) on IT-development in Akkreditierung Austria

- development of a fully digital database for accreditation, which contains all information in electronic format (from applications of CABs over competence follow-up and to assignment of assessors, assessments, reporting, resolution of findings AB, decision-making, rating of assessments/assessors until depiction of accreditation scopes as soon as a decision is taken)
ABs have limited amount of ressources (personnel and financial) to develop solutions
 - due to size of industry and amount of ABs looked at solutions available for CBs, which didnot fulfill sufficiently the required AB processes => individual programming (for all EA ABs would have made a lot more sense though)

Strategic plan (idea) on IT-development in Akkreditierung Austria

- only finished 30 month ago, quite some resistance to change from assessors - CABs mostly more open, as they understood, that accreditation processes could accelerate
- only recently considered to start to use advanced Comparison tools of documents - ChatGPT would be a good solution, but the required confidentiality for ABs with the data of accredited CABs not available with free versions and quite difficult to guarantee (AI is learning with every input => will need very strong security barriers)
=> AA still in the early stages, but nevertheless more developed than most ABs in Europe
- no intention to develop IT tools to assess the advanced IT tools used by a few CABs

Next steps in Akkreditierung Austria (AA)

- for file-managers: concentrate data and facilitate management of CABs in order to avoid overlooking and be more on-time, development cost difficult to argue and finance
- for assessors: competence of assessors with interconnected thinking superior to AI; if AI is used too much only AI systems will be able to assess AI systems => not the intention of conformity assessment to be controlled by AIs but personal interaction / decision-making
- AI applications as a supporting tool for assessments (average age of assessors in AA above 50 years => preparedness to freely adopt changes is limited => a lot of convincing required
 - will only work, if the tools are easy to use, reduce the difficulties / workload of assessors

AI Act

- first requests were made from big companies to some ABs on how the implementation of the AI Act is planned from the AB side
- no concept yet by EA ABs, but at least we started to discuss recently within EA on this subject – challenges are even bigger as with AI in general, as AI used in critical applications will either need highly specialized AI experts (availability problem) or AI software to check AI software while maintaining the trustworthiness

Conclusions 1

- the plan implemented by AA is still only the 2nd best option
- need of a more concrete collaboration between ABs in order to tackle the many topics the best possible and with an as high as possible competence / subject => this is a cultural change and without strong external pressure will not happen easily / quickly, but at least a corresponding understanding is starting to show

Conclusions 2

- learned to know very recently, that at least one company is considering to develop AI tools in the field of Conformity Assessment
 - a. check-audits, show critical audits (risk-profiles)
 - b. chat with your data (the more you use it the more it understands your requirements),
 - c. task assistant (bring things to attention from available data, which is required for a role)
 - d. Audit/Assessment planning (find auditors with the appropriate qualification, show last NC from a customer and their resolution, top risk-factors,

Conclusions 2

- learned to know very recently, that at least one company is considering to develop AI tools in the field of Conformity Assessment
 - e. audit preparatory assistant (Document summarization of content, creation of a risk-profile for auditee, planning travel routes)
 - f. suggest a detailed, structured NC description based on ones input (letting you know, what is missing), give most likely root-cause for NCs, show correlated finding, show sustainable corrective Actions

Thank you for your attention!

Looking forward to questions and a lively discussion.

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