Are you unsure about how to benefit from AI? You're not alone!

We have all heard the stories of "AI" being used to diagnose cancer, drive cars, and even detect fake news. However, it isn't always easy to see through the hype to tell how these technologies might help **your** business.

What is AI?

We assert that most of what is referred to as "Artificial Intelligence" is nothing more than the natural continuation of improvements to Information Systems with faster, more powerful algorithms and increased volumes of data. Natural language for input and output has allowed us to progress beyond text and icon-based interfaces. Advances in image processing have allowed machines to "recognize" objects and people. Increases in processing speed allow these algorithms to be performed "fast enough" such that the processing time is not noticeable to human users.

One particular breakthrough is significant: advanced "smart" algorithms that perform **self-configuration** by adjusting their own rules (e.g. decision criteria, or statistical characteristics such as thresholds, weights, coefficients, etc.) during their processing. This relieves us of the need to define and specify all the detailed rules[1] before they are executed, and just as well, as the extent of the full set of rules often exceeds human capabilities. The downside is that these self-adjustments reach the point where **we no longer know how they work.**[2] Without upfront specifications and detailed rules, there is no way to "reverse engineer" the obtained results.

In addition, let's bear in mind that smart algorithms are necessarily designed by human beings and are not self-generating by machines; they are still just "mechanical calculating systems" with **known limitations**[3]:

1. It is impossible to guarantee the absence of **bugs** in a computer program, whatever its algorithm;
2. No machine is capable of "understanding" the intent of its algorithm;
3. It is unlikely that insight or invention can "emerge" by themselves from unstructured or pseudo-random data sets.

And this will remain true, despite the predicted increase in machine performance and volumes of data.

On the other hand, human beings, being capable of thought and **knowledge**, don't have any such limitations. Humans are able to:

- Invent new solutions to existing problems, by *thinking outside the box*;
- Be "lucky", coming upon a breakthrough by *accident*;[4]
- Be *creative*, putting together seemingly unrelated ideas to solve "wicked" problems;
- Produce models of reality at various levels of abstraction and express *tacit knowledge* within any **professional domain**.

AI as part of a larger system

Smart algorithms do not exist in a vacuum, but are always part of some larger system including people. In such a Human-Machine System, the people and the machines interact in an **integrated** way. The purpose is, by definition, to help humans (including customers, staff, suppliers, etc.) better perform their tasks through the use of advanced technology. It would be a serious mistake to consider people and machines as "interchangeable parts" of such a system.

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[1] To be exact, all of the fundamental structural rules must always be specified by the system designer, and the algorithm is limited to (re)defining the parameters, no matter how far-reaching those may be.

[2] For example, see MIT Technology Review, "The Dark Secret at the Heart of AI"
https://www.technologyreview.com/s/604087/the-dark-secret-at-the-heart-of-ai/

[3] For more details, refer to the work of Turing, Gödel, Chaitin, and Kolmogorov.

[4] 9 such inventions are described here: https://www.inc.com/tim-donnelly/brilliant-failures/9-inventions-made-by-mistake.html

In today's world, implementation of several successive generations of IT systems has left very few purely manual tasks in most business environments. Most tasks are mixed, either human-centered aided by machines or machine-centered overseen by humans. This requires us to focus on User Interfaces (UI, often broadened to a concept called UX for User Experience). Regardless of the underlying technology, the UI must always be controlled and driven by the human!

Implementation considerations

When implementing a natural language interface (VUI for "Vocal User Interface"), e.g. chatbot for textual input or virtual assistant in a smartphone or home speaker for vocal input, it is essential to begin by eliciting and specifying the **critical tacit knowledge** of the **business domain** in order to delimit the applicable conversations, e.g. can't order a pizza from a medical service, as well as to customize the dialog, e.g. a medical app recognizing that "temperature" and "pressure" probably pertain to the human body and not to the weather. This will provide true added value to the users and contribute to implementation of high performance Human-Machine Systems.

A final note about AI **projects**: regardless of the algorithms involved (e.g. process automation/robotization, conversational assistants, robots, self-driving vehicles, etc.), AI projects are still complex IT projects. As a result, standard IT project practices remain valid, even (or especially!) in "agile" or "lean" modes.

Who we are

Aebis Inc is dedicated to enhancing human work performance through the use of proprietary cognitive technologies to enable rapid and accurate human-to-human and human-to-machine knowledge transfer. We have developed a set of patented technologies & approaches that quickly identify "tacit" business-critical knowledge held solely within the minds of a small number of experts (who are often not the highest-placed in the organization), model this knowledge, and present it back in an easily assimilable form which can then be transferred to other team members or can inform the development of digital assistants. Aebis, Inc. is a NYC-based spin-off of Paris-based BFD, which has assisted major financial institutions with systems architecture, process improvement, advanced business information systems, knowledge management services, and expert-systems for nearly 30 years.

Some of our customers:*

(*) Customers based in France served by Aebis' parent company BFD Group

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