A GUIDE TO AUTOMATING USING AI

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ABSTRACT

AI CAN DELIVER NUMEROUS BUSINESS BENEFITS. BUT AUTOMATION WITH AI COMES WITH A NEW SET OF CHALLENGES AND RISKS. ORGANISATIONS WILL ONLY MAKE A SUCCESS OF AI IF THEY CAN EFFECTIVELY GOVERN WHAT *SHOULD* BE AUTOMATED (NOT JUST WHAT *COULD* BE AUTOMATED).

This article considers automation with AI and concludes that automation with AI must be:

- <u>Ethical</u> – to ensure that the automation meets ethical principles and policy;

- Controllable – to provide effective and timely control;

- Viable – to ensure that the desired outcomes can be delivered without unforeseen circumstances;

- Desirable – to ensure that the business case for it includes thorough understanding, analysis and mitigation of the AI-specific challenges and risks as well as the benefits.

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WHAT IS AUTOMATION?

Automation enables processes to be organised differently so that more responsibility is transferred to technology. This can improve:

- efficiency and productivity—by reducing error rates and improving process throughout and pace;

- compliance with regulation and policy—by understanding the level of compliance, detecting non-compliance and providing mitigations with respect to security, safety, ESG and other organisational obligations;

- the experience of people involved in the process—by freeing them up from routine activities, giving them better tools to conduct their work and providing better interaction with technology;

- the range and quality of data and analytics to support further improvements.

Organisations have been automating their processes for many decades, so what is different about AI? There are many different taxonomies for AI (for example, those provided by Russell and Norvig, Poole and Mackworth or the different perspectives offered in the Creation of a Taxonomy for the European AI Ecosystem). Figure 1 provides a simple summary.

Understand
- Environment
- People and emotion
- Images
- Speech
- Documents/text
- Fraud
- Anomalies

Decide and plan
- Prediction
- Personalisation
- Goal achievement
- Optimisation

Act
- Robotics
- Autonomous vehicles
- Speech
- Documents/text
- Augmented reality/ virtual reality

Figure 1: AI and automation capabilities

The different taxonomies (and Figure 1) show that the scope of AI and the range of different applications is very large. But it cannot just be treated just like another new technology. The key to understanding the impact of AI on automation is that AI is a different type of information processing. It's very different from conventional IT and (despite the name) it's very different from the information processing that people and teams carry out. These differences introduce new and different types of risks.

This is not just a theoretical issue because the pace of technology development is rapid. This is creating a perfect storm:

1. **Growth of AI.** The use of AI in organisations is growing fast. It will become pervasive and embedded in multiple forms in business processes.
2. **Risks.** Deliberate or inadvertent misuse of AI (for example, through "artificial stupidity or other causes") risks triggering reputational, compliance or financial damage. At a wider scale, the proliferation of AI, and increased energy use, may inhibit sustainability.
3. **Urgency.** The problem cannot be deferred. An ethical approach to AI and automation needs to be designed in and cannot be retrofitted.

Without a clear approach to AI and automation, AI will be in the hands of business users and technical teams driven by financial and delivery pressures without a clear understanding of the risks or the means of mitigating them.

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So, what are the differences that organisations need to recognise and respond to? There are the following five considerations:

- The commoditisation of AI and scale;

- The ethics of AI;

- Automating access to organisational knowledge;

- Maintaining control as the complexity and rate of change increase;

- Understanding how to change to incorporate the new realities of AI.

Commoditisation of AI and Scale

Automation technology is enabling AI to be used much more easily and the promise of intelligent automation is becoming a reality. Many people will be able to automate activities using AI for themselves, without involving professional teams.

There is a considerable focus on improving the ability of AI teams to create and deploy models through technologies like MLOps (machine learning operations). But AI is increasingly present in software products and services, partly because there are so many AI tools for developers to use (through libraries for Python and other languages as well as ubiquitous cloud services).

More than that, AI is built into so-called no/low code tools like the Microsoft Power Platform and many others. These tools reduce the level of skill required for development (by enabling users to develop through a straightforward user interface rather than by writing code).

Implementing using AI is no longer the preserve of highly expensive data science and AI engineering teams. Ordinary developers can use AI and even so-called citizen data scientists and citizen developers, without any professional expertise, can use it.

This means that the governance of AI implementation has a challenge with scale. Any control mechanisms need to apply outside the domain of specialists.

The ethics of AI

Many ethical questions are likely to arise when machine learning is implemented (machine learning has driven the recent increase in AI). Machine learning uses data that, in itself, reflects the biases and ethical issues of society. So, "bias is machine learning's original sin" and comes in many forms.

In order to address ethical concerns, regulators are well aware of the need for regulation. For example, the EU has published their proposed approach and the US Administration has published their Blueprint for an AI Bill of Rights.

Organisational Knowledge

AI and automation also provide the possibility of automating access to organisational knowledge, whether this is through chatbots, document analysis, providing AI explanations or through improved human collaboration. This means that AI can both improve access to existing organisational knowledge and also generate new knowledge.

Control

Because of the power of AI, increasing automation introduces a new concern: control. There are two key questions:

- How should the use of AI be controlled so that it meets the ethical requirements?

- How can it be controlled fast enough to avoid unfavourable outcomes? Automation can accelerate the pace of action and can introduce greater complexity that people will have difficulty understanding and making decisions about.

Organisational Change

Many of the issues associated with AI and automation concern people. Automation carries a threat of job losses affecting different roles differently even if there is also the potential for the creation of new jobs. The key is trust—AI will not be successful if it is not trustworthy.

AI enables relationships between technology and people at a greater cognitive depth and can enable very different types of business process. As a result, automation with AI at scale requires a rigorous approach to the design of business processes and the relationship between people and automation and a careful organisational change approach that recognises both the need for trust and the extent of the change.

What should be automated?

These considerations mean that organisations need to be very clear about what *should* be automated, not just what *could* be automated. AI needs to address the four topics shown in Figure 2. AI must be:

- Ethical—to ensure that the automation meets ethical principles and policy;

- Controllable—to provide effective and timely control;

- Viable—to ensure that the desired outcomes can be delivered without unforeseen consequences;

- Desirable—to ensure that the business case for it includes thorough understanding, analysis and mitigation of the AI-specific challenges and risks as well as the benefits.

Ethical	Controllable
is the proposed automation ethical? Does it meet the ethical principles and policies in place?	Is the proposed automation controllable? Can it be controlled fast enough?
Desirable	**Viable**
Is there a business case? Are the risks and potential impacts understood and acceptable?	Is the automation viable? Can the desired results be delivered? Are the required enablers in place?
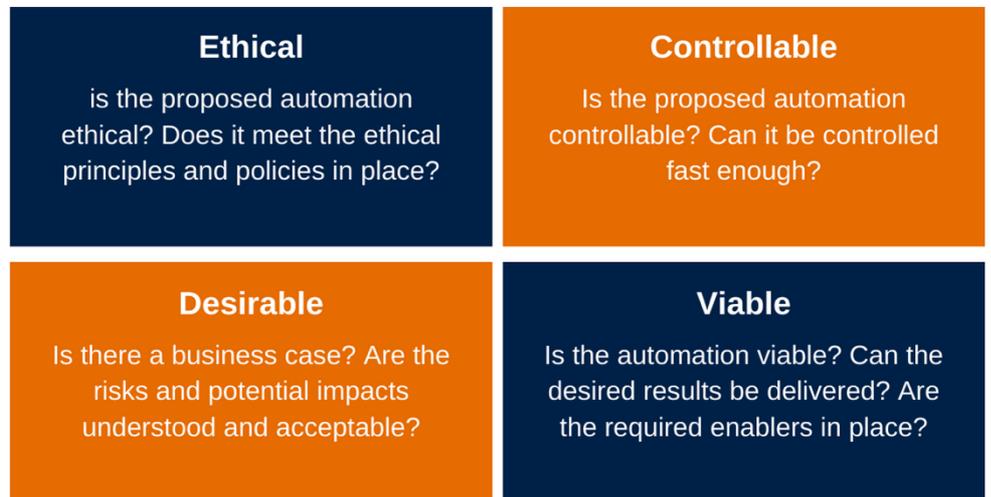
Figure 2: What should be automated?

ETHICAL AUTOMATION WITH AI

An ethical approach to automation is essential. But implementing AI ethically is hard: "Organizations can start with an admission: Getting serious about ethical AI is no easy task". An incremental but transformational approach is required that embeds the five components of ethical transformation:

1. **AI governance:** to define the direction of travel, the priorities and the changes required;

2. **Analytics:** to understand the impact of AI ethics challenges and how to resolve them;

3. **AI implementation:** to measure adherence to AI ethics principles in the development and use of AI;

4. **AI ethics enablers:** to measure the maturity of the enablers (or inhibitors) of ethical AI;

5. **Transformation:** an incremental approach to learning and improvement.

Without these components, it will not be possible to understand the ethics of AI but also its viability (see Figure 2).

Controllable automation with AI

How should control over the design and use of AI be exerted? To answer this question, it is important to understand what control needs to achieve. As discussed above, there are some particular control challenges.

The fundamental question is this: how should autonomy be balanced between humans and AI? Implementation of the ethical principles implies the need for high levels of human control. But how should this be achieved--what mechanisms should be used? Control can be applied at many different levels including, for example:

- Society and the market: through regulation and accreditation;

- Organisation: through culture, AI governance (as above), policy, operating model design, process design and business analysis;

- User: through user research and user experience;

- AI implementation: through model design, assurance and testing.

The need for high levels of human control has long been argued by Shneiderman (2022) in his book "Human-Centred AI", amongst others, in line with well-established models for digital development. But Shneiderman's analysis is not about placing control just with either humans or AI. He argues for processes and interfaces that exhibit "high levels of human control AND high levels of automation" and suggests different types of control. This approach can result in increased human autonomy and closer alignment with ethical principles.

The increasing automation of AI enables faster decision-making or action either through direct automation or by switching decision-making closer to where it is needed. In either case, any unfavourable outcome will be triggered faster. In the worst case, there is a risk that automation will both contribute to, and accelerate, the type of event described by Taleb (2007) in his book "The Black Swan: the impact of the Highly Improbable". These are events that generate very unfavourable and damaging outcomes (for example, the financial crash of 2007/8) but which are rare (and therefore not present in data or organisational knowledge).

The commoditisation of AI means that non-professionals (for example, any business user) may have access to AI through no/low code technology. Control mechanisms that applied to (relatively) small teams of AI professionals or developers will not work at much greater scale. How can the right balance between empowerment and control be established? What guardrails will be needed to control at that scale?

A thorough analysis of these questions is needed to understand how to apply tradeoffs to automation with AI. Tradeoffs are required throughout the design and implementation process. They concern the balance between different types of requirement (for example, explainability vs model effectiveness), architecture (for example, the use of edge AI vs centralised AI), prioritisation of expenditure (for example, on data quality improvements vs model development) and many others. The risk in each case is that tradeoffs are made implicitly or without sufficient scrutiny resulting in unexpected results. Mitigating these risks requires iterative, cross-functional communication.

Viable automation with AI

People can be nervous about the implementation of AI because of its potential effect on jobs and the changing relationship between technology and people. A human-centred approach (discussed above) can mitigate some of the risks but, nevertheless, there are a number of uncertainties to take into account.

Many organisations have found it difficult to scale AI implementations. Therefore, it is important to understand if the capabilities required for implementation are sufficiently mature with respect to AI. These include the following:

- Ethical assurance and governance;

- Data governance;

- AI implementation;

- Human-centred digital implementation capabilities (like process design, user research and user experience);

- Organisational change.

Without these, is the proposed implementation viable?

Desirable automation with AI

The benefits that AI can deliver are summarised above but the implementation of AI needs a business case that recognises the particular characteristics of AI. As well as the contents of conventional business cases, there are a number of AI-specific questions to address:

- How well does the planned approach meet the ethical requirements?

- Is it sufficiently controllable?

- Is it viable?

- Have the tradeoffs been fully considered?

But more than this:

- Does it just automate current processes or consider how to improve them to take advantage of the unique capabilities of AI?

- Will the implementation and the use of the AI be trusted:

  o Is the proposed implementation fully understood? Are the risks and impacts, on people and organisation, as well as technology, well understood and fully mitigated?

  o Have the organisational and people changes required been planned and can they be implemented effectively?

  o Will people trust the AI?

CONCLUSION

AI is very different from the processing of conventional IT and (despite the name) it's different from the processing that people carry out. The scale of these differences means that AI cannot just be treated just like another new technology.

Automating with AI needs a thorough consideration of the four factors shown in Figure 2. AI must be:

- Ethical—to ensure that the automation meets ethical principles and policy;

- Controllable—to provide effective, human-centred control;

- Viable—to ensure that the desired outcomes can be delivered without unforeseen consequences;

- Desirable—to ensure that the business case for it includes thorough understanding, analysis and mitigation of the AI-specific challenges and risks.

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