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The Top 10 Challenges of AI Adoption

Whitepaper

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Introduction

We are seeing organisations, big and small, starting the process of exploration of artificial intelligence. Some of these companies are well advanced in their adoption of intelligent technologies, however for many companies they are just at the beginning of this challenging adoption journey.

In the following chapters we will look at a number of challenges that we see as causing potential blocks to the adoption of artificial intelligence at scale in organisations.

We have identified ten top challenges for the adoption of AI at scale that we see many firms experiencing at some point in the early years of AI adoption. Many occur when the organisation moves from the innovation lab to production ready live applications.

In addition to these ten challenges, we believe there are a few fundamental differences between intelligent based technologies and more traditional IT solutions, that also make the adoption of AI more difficult.

Two Fundamental Differences:

- **It's an Art as much as a Science.**
  That is the technology works in a very different way to normal technology implementations, requiring iterative experimentation to find an optimal solution. But also needs careful monitoring, maintenance and retraining when in production for optimal performance.

- **Managing Expectations**
  With the various stakeholders using the intelligent solutions, of how AI works and performs, as expectations for such systems are often beyond what is possible.

Top 10 Challenges for AI Adoption

1. **Conflicts** between IT Departments & Data Science Teams (sometimes the Data Science work is done initially within the business lines / business users)
2. Scaling AI Challenges with **Multiple Data Science Teams**
3. **Middle Management** Fighting over ownership of Data Science
4. Business Users not **trusting the technology** (taking 6 months to approve)
5. Confusion with the **number of vendors** / products / tools and platforms
6. **Data Bias & Ethical Issues** slowing acceptance and adoption
7. Correctly defining the **Governance model** for monitoring and control
8. Changes in **Culture and Organisational Structure** needed across the organisation with the democratisation of data (information & knowledge)
9. Need to **skill existing teams to** better understand how AI/ML works
10. Need for a top-level **Vision and Strategy** for how the business will become AI First

For each of these challenges we explore the underlying reasons for each one and highlight methods to help manage and mitigate them to ensure you can progress with your adoption without these problems causing impediments.

While some of these challenges will have a technology element to them, we find that many relate to people, process, organisation structure and culture.

With the introduction of more complex technologies, the process of embedding them into your organisation can become difficult, especially with limited internal skills and knowledge about the techniques. At Wisdom Works we have a core team of AI experts that have a range of industry sector experience who can help with your AI journey, from vision & strategy to delivery & operations.

Wisdom Works is also developing a next-generation AI platform that provides a range of supporting tools and frameworks that reduced the potential pitfalls of many of these challenges.

We hope you find this whitepaper informative and can apply many of these practical approaches to your own situation. We would also welcome discussions with you on how we can support you to accelerate your successful implementation of AI at scale.

Prof Andy Pardoe
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1 – Team Conflicts

The People and the Culture plays a significant role into the success of scaled AI deployments within an organisation. This can be the case for any new technology being rolled out within an organisation. Issues with not-built here and skills gaps will naturally cause friction and resistance.

However, unlike many other new technologies, the operational model for delivering and maintaining machine learning models is very different from other standard technologies. These differences then cause problems between the data science team and the rest of the IT team. Conflicts between the CTO and Head of Data Science can occur, and this can ripple down the whole IT department.

With standard IT workflow moving from the waterfall methodology to agile and lean, together with the move to a DevOps approach can help bring the two areas closer together.

Additional conflicts can happen between IT and the Business users, as often is the case, change is resisted, but here there seems to be additional concerns about Trusting the Technology and Job Security. This makes for complex discussions with the business units. Projects can be stuck in testing and QA for many months while the end users are slowly convinced by senior management that the technology is safe and controlled and jobs are secure.

With deep collaboration and involvement business users can be converted to be advocates of the technology, and we have seen this even to the point where they want to use the technologies to help train junior staff (making them more efficient and knowledgeable quicker).

Understanding that AI and Culture go hand-in-hand, and as an organisation the cultural considerations must be addressed as urgently as setting up new data science teams and conducting innovation activities.

2 – Multiple Data Science Teams

In large organisations, the drive for innovation often leads to multiple teams looking at using the same types of technologies but focused on their own siloed applications and users.

We have seen some organisations having over 15 individual data sciences teams across the firm. All relatively isolated, and all using different technology stack, workflow processes and tooling.

While this approach can allow rapid innovation and exploration of new technologies, it does cause some problems when you want to have some economies of scale, standardising the technologies and allowing the team members to be able to share knowledge, skills and capabilities across the organisational boundaries.

Often this will be solved by implementing a Hub-and-Spoke organisational structure to the data science teams. Allow one central team to control the standardisation of the approach and supporting the spoke-teams with their specific business aligned functional deliveries.

If this operational model is implemented too late, it will become challenging to standardise the platform, tools and frameworks. If done too soon, it can slow down the adoption and innovation focus to learning the new technologies.

Often the size and scope of the Hub may change over time and between organisations, based on preferences for centralised or decentralised models of control and command and the needs of the organisation at the time.

3 – Middle Management

Part of the challenge with the previous item (multiple data science teams) is driven by the need of middle management to take control of any new and exciting technologies that are seen as a growth area and potentially help with their own job security. If you own the data science team in a given area, you will be safe as this is the future.

While this might be a cynical view, we have seen many department heads of data science, who have minimum depth of knowledge of machine learning algorithms. This is natural while the topic is new, and we are all learning the technology as we go.

However, the senior leadership must understand this is the case, and ensure they seek more experienced guidance and advisory to ensure some of these potential issues and challenges are understood, managed and minimised.

Potentially this can cause an increased fragmentation of data science teams, that only reinforced the need for the Hub-and-Spoke model to centrally control standards and approach.

Ultimately having strong organisational knowledge in how to apply these new technologies will be a competitive advanced and eventually a commodity. What we need to ensure, is that these technologies are implemented with all ethical and data bias concerned covered, together with a responsible and AI for good ethos that provides the correct level of controls, audit and governance that is needed.

4 – User Trust

Over the last few years, we have seen a number of examples, particularly in the public domain, where trust in algorithms and AI has been brought into question.

The first example of this is with the exam grading that was done in 2020, due to Covid-19, some of the grades where inconsistent and so the trust was destroyed, and they had to revert to teacher grading instead. Another example was around the use of facial recognition by police forces both in the UK and USA, and a number of the larger technology firms distancing themselves from such applications.

In the private sector, we also see resistance to adoption of intelligent solutions. Users have required excessive periods of parallel testing to ensure they are comfortable with the technology. It is important for users to use the technology, appreciate what it can do and its limits, so they understand how it can help them. Typically these technologies are just augmenting the human workforce, automating the mundane and freeing up time to focus on more interesting work.

5 – Technology Landscape

You may have seen one of many technology landscapes of AI, Automation and related technologies that shows hundreds of various vendor solutions, many in each specific area of the landscape.

With many thousands of AI companies across the global all looking to provide intelligent solutions to various industry sectors or functional problem.

Added to this vast number of vendors, tools, frameworks, platforms and algorithms, is the fact that this is also a very complex and dynamic landscape. That is, the capabilities of different vendor products are changing rapidly, some of the larger technology companies are releasing new versions of their tools and models on a monthly basis.

Then we have the research landscape (both academic, institutions and commercial) driving new capabilities, from deep learning, reinforcement learning to natural language understanding and everything else in-between. Infact we have more researchers working on Artificial Intelligence outside of universities.

So how does a company decide on the right combination of technologies to use?

The simple answer is it depends.

It depends on your current technology footprint.
It depends on the current skills within your existing team.
It depends on your objectives for using and building intelligence solutions.
It depends on the complexity of the problems you are looking to solve.

It depends on so many different aspects that it requires detailed specification and aligning with your business and technology strategy and priorities.

6 – Ethical Issues

We could and probably will write a whole whitepaper on this area just by itself. We covered many of the aspects of this area in one of our Live Shows last year with Professor Nigel Crook, director of the Institute of Ethical AI.

Live Show with Professor Nigel Crook (S2 E1)

July 30, 2020

A recording from our second monthly Live Show with Professor Nigel Crook, Director of the Institute of Ethical AI at Oxford Brookes University. The talk focused on many aspects of AI Ethics. Nigel shares the work he is doing at the Institute including how they support businesses needing guidance on...

To listen to this episode and many others visit TheAIFutureShow.com

But for the purposes of this paper, we can see a multitude of challenges with ensuring as we Scale AI, we have the controls, audit, and governance in-place to keep our customers safe from any unintended consequences.

We also need to provide the tooling and education to the data science teams so they can operationalise the processes and workflow needed to minimise the risk of such problems occurring.

There are a few emerging ethical frameworks being constructed by various institutions to help provide the best-practice in this area.

7 – Governance Model

For many larger organisations, they will already have an IT governance model operational which is used to review to ensure the standards of work done on all new IT related projects.

In this case, it is simply a question of placing additional checkpoints within the model to ensure best practice of the machine learning model development, deployment, control and maintenance has been followed.

Complexities come into the discussions with the business users / departments in terms of dealing with error conditions and rough processes. However, we should not view AI, ML or Automation any differently to other types of technology.

For smaller organisations, starting to adopt AI technologies is the perfect time to implement IT governance control processes, checkpoints and review. This will ensure you are following the correct methodologies in designing and developing intelligent solutions, protecting your business from potential reputational risk and most importantly providing the level of audit and transparency that is needed for your customers safety and trust.

There are multiple factors to consider with setting up a governance model, both from a technology perspective but also from an operational and organisational perspective too.

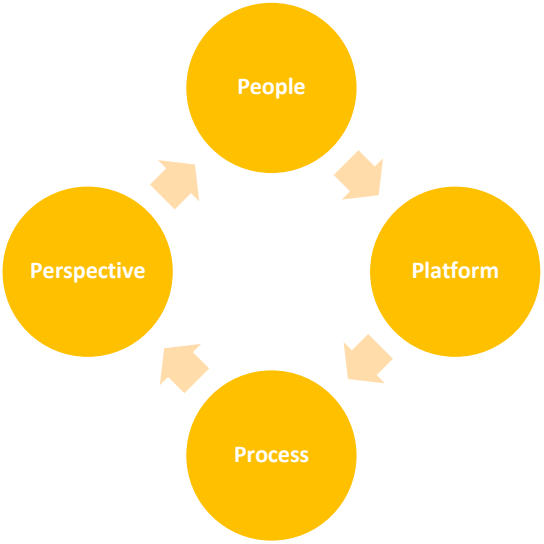
8 – Culture and Organisational Structure

Many IT projects and programmes struggle to deliver on budget and on time and many of the reasons for this relate to the people, culture and organisational factors.

These pressures still exist when the IT project involves intelligent technologies, however, the issues are actually compounded because the acceptance and trust of intelligent solutions can be more problematic than normal IT change programmes.

These considerations need to be actively managed and resolved if projects are to be successful and accepted by the business users.

Our four P's implementation framework allows us to actively monitor and manage the progress of all aspects of potential impact on a project, throughout its delivery phases.



- **People**
  a fucus on the people involved in the project, both the delivery team and the business users
- **Platform**
  selection of the technology platform is a key element of the success of the project
- **Process**
  understanding the process and workflow being implemented or changes with the project
- **Perspective**
  consideration of the functional requirements of the solution for all user roles & stakeholders

9 – Skills & Training

With any new technology, there is a need to support the education and training of relevant skills needed across the teams.

With AI, Machine Learning and Data Science, we see a number of new roles being created. From ML Engineers, ML Ops, Data Scientists, Model Controllers, Head of Ethics and Chief AI Officer to name a few.

Each of these roles needs a specific and unique set of skills and experience to perform the tasks required.

Education for the acceptance of intelligent technologies is typically needed across the organisation and not just within the implementation team. From the executive C-suite, to the business users, technology teams, the support teams, plus related functions such as architecture and audit for example.

We advocate setting up various communication and educational activities such as a Community of Practice (CoP). We have deep experience in doing this in various organisations and can advice how to do this successfully within your own firm.

Read more about CoPs on our insights blog at **wisdom.tech/blogs**

10 – Vision & Strategy

Many companies will start to explore the use of AI and Machine Learning as an Innovation activity but without a departmental or firm-wide strategy that is driving the adoption.

While we understand the ambition to learn these new technologies and explore how they work and what they might help solve, this approach can lead to dissatisfaction and problems showing strong return on investment.

If we see intelligent technologies as a tool to be used to solve specific problems, then we much work back from the business strategy. Understanding the real business drivers and the systematic challenges that need solutions. By referencing the business strategy and aligning it to the IT strategy, opportunities will manifest to apply AI and machine learning to solve the business problems that need such solutions.

This will produce a much stronger business case and allow the IT department to take a more portfolio perspective on exploring the use of machine learning across the organisation.

There may be many potential use-cases for Machine Learning, from customer support and customer experience to back-office report reconciliation and predictive maintenance. By seeing how AI might be deployed across the organisation at scale longer-term, it will allow those architecting the tools and frameworks to take a more strategic perspective on vendor and technology selection.

It is also important to understand if the intelligent solutions will be seen as competitive advantage, or just a commodity that is needed in order to stay competitive. This is important as it will shape the options in which AI and ML can be built and deployed.

Some organisations may want to have a separate vision and AI strategy document, while others may prefer to add a section into the existing IT strategy document.

Conclusions

This whitepaper has looked at the top 10 challenges for the adoption of AI technologies. For each we have highlighted some of the key considerations and ways in which we can help mitigate the typical problems that are common.

We do acknowledge that every organisation is unique and so the full set of challenges will be different and so the approaches to solve them need to be tailored to optimise the results for each client.

If you have found this informative and some of these issues and challenges are evident in your own company, we would be very happy to schedule a meeting to discuss in more detailed the specific problems you are facing and how we can provide the tools, frameworks and processes to smooth the adoption journey.

Feel free to directly contact us at sales@wisdom.tech
or call us on +44 333 40 40 373

Wisdom Works is very well placed to help clients with the various challenges that building and deploying these advanced AI capabilities create. We have devised a number of frameworks and tools to support the accelerated deployment of AI at Scale within organisations of any size.

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About Us

Wisdom Works is a technology and business consultancy firm that helps organisations realise the benefits from the application of intelligent solutions both within their organisation but also for the products and services you deploy to your customers.

At Wisdom Works we believe that advanced intelligent solutions will be transformational over the next decade, completely altering the business landscape. Using intelligent solutions across all parts of your business will be commonplace and will be needed in order to offer competitive and differentiated products and services.

We recognise that to realise the full potential of these intelligent technologies requires not only in-depth technical knowledge but a full appreciation of the full range of challenges with deploying such impactful change projects within an organisation. This involves an in-depth understanding of how the various stakeholders will respond, the modifications needed to the processes and workflows as well as changes to how the systems and applications will function.

Our client focus is reflected in our core team who have both a strong academic background as well as extensive industry knowledge with many years of practical experience working within and for organisations.

Visit our website to learn more about us wisdom.tech

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