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FIELD GUIDE:
LEVERAGING AI KPIs

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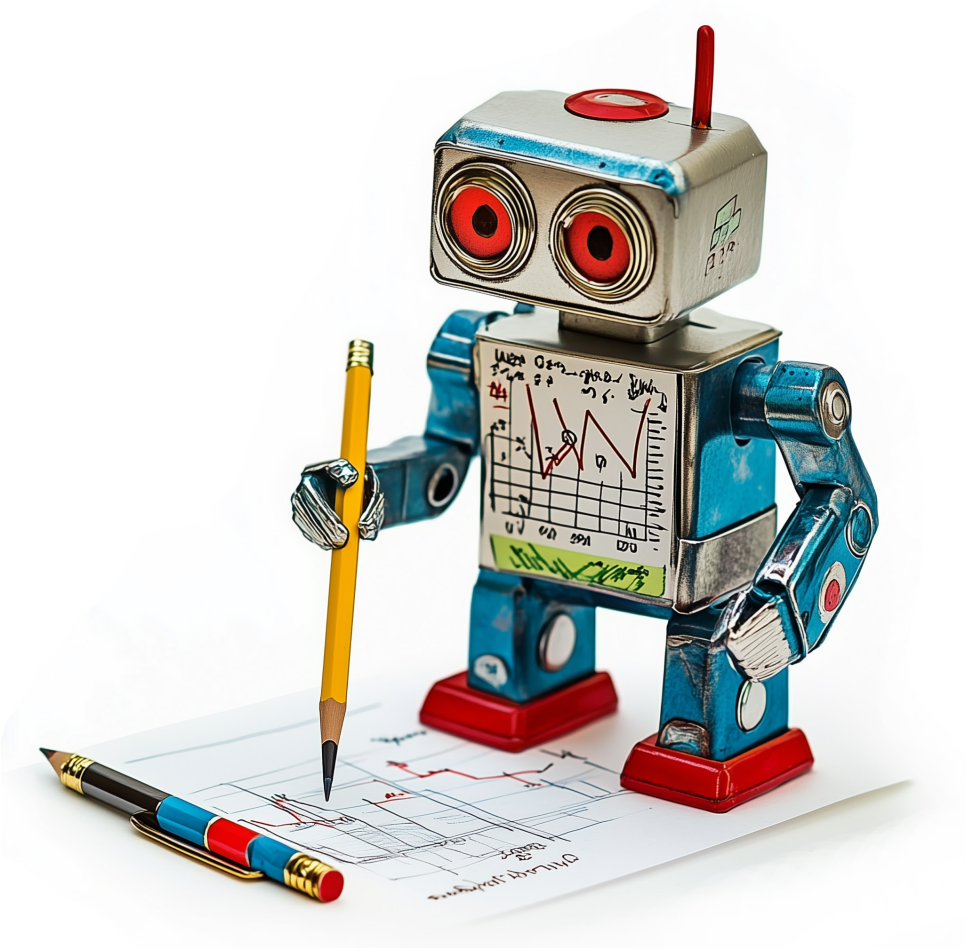

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Welcome

After three decades of helping clients achieve results through performance measurement, there are some key concepts and ideas I have discovered that can make going live and getting results from your KPIs much smoother. This guide is the distilled summary of that experience. I hope you find it useful.

Bernie Smith

Founder, Made to Measure KPIs & KPI Academy

> **Many organizations have vast reserves of unstructured data. This data is often viewed as inaccessible for reporting and analysis but can offer unparalleled insights when unlocked.**

Field Guide Intro

About this guide

New technology brings new opportunities. It also brings hype, “fear of missing out,” and disappointment. AI is proving to be no exception to this rule. So the questions that many of us are currently considering include “What is AI really?”, “Can it help us succeed?” and “Are we missing out?”

Running a business focused on performance measurement, I have been mulling just the same questions in the context of KPIs, analytics, and decision-making. This field guide is designed to help untangle the useful from the mythical and the practical from the distracting when it comes to using AI KPIs.

Bernie

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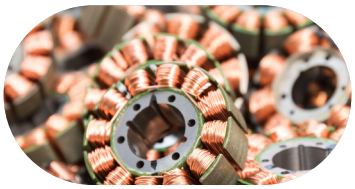
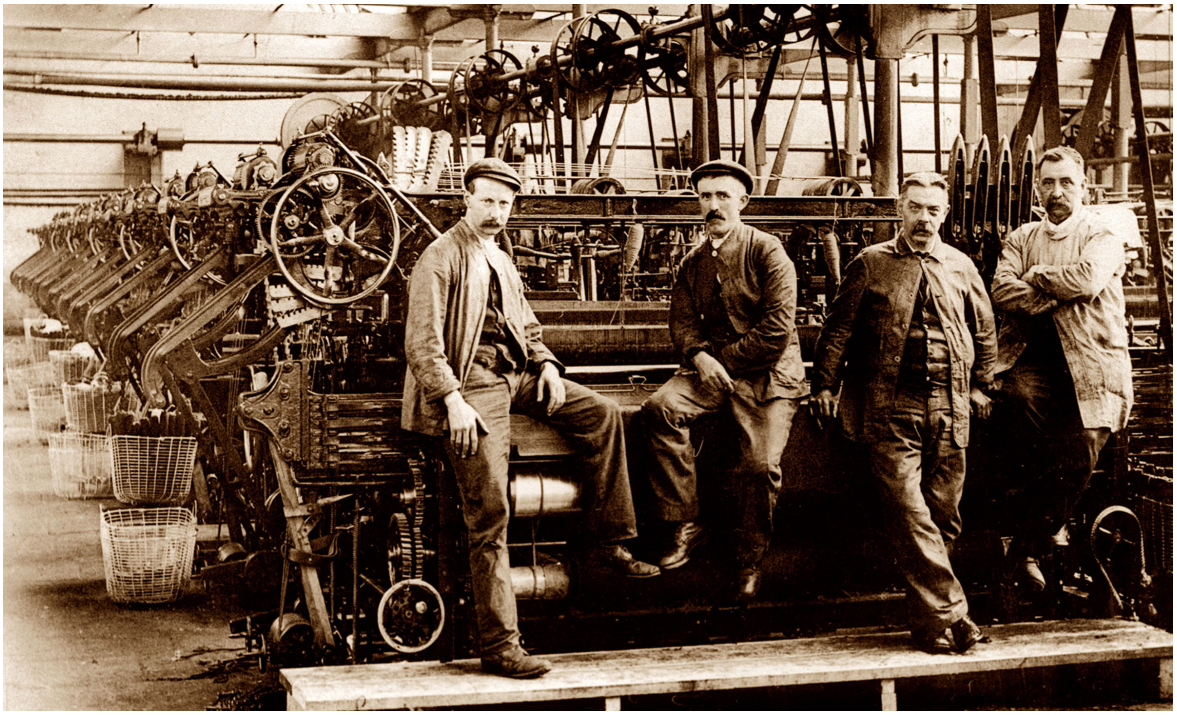


00. Learning from history - Electric motors

Historic technological innovations can give us powerful insights into how current innovations may play out. One such historic innovation was the electric motor[1].

Shortly after their development, electric motors were treated as direct replacements for steam engines in factories. A large electric motor would be shoehorned in to replace the existing steam engine, and all the machines in the factory continued to be run from a long shaft that stretched the length of the building. The layout of the factory was completely determined by the central line shaft with the power distributed through a complex system of belts and gears. The results were disappointing, and adoption of electric motors in manufacturing was slow.

It took many years for the true benefits of electric motors to become clear. The real opportunity lay not in replacing a single, central steam engine with a large electric motor, but instead in equipping each machine tool with its own individual electric motor. This freed factory designers to restructure the layout of the site to benefit the natural flow of production rather than distribution of power.



"...our challenge is to understand how and when we should harness AI to improve our performance measurement, insight, and decision-making."

By the 1920s, electric motors were finally delivering on their promise of soaring productivity, **50 years** after the initial excitement of their commercialization.

This example and later innovations, such as the invention of the computer, lasers, and the discovery of graphene, show that new technologies do not immediately deliver their full benefits. We need time to discover the potential and to tease out the opportunities. And this process can take **decades**.

So, our challenge is to understand **how** and **when** we should harness AI to improve our performance measurement, insight, and decision-making.

The big questions

If you're thinking about artificial intelligence from a management information, performance measurement, or analytics perspective, these are the questions you might be asking, and that this guide aims to address:

- What is AI...really?
- How can AI help me with KPIs?
- What are the risks?
- Should I be using AI?

01. What is AI...really?

Our first source of confusion comes from the fact that artificial intelligence is a **field** of computer science rather than a single technology. So, leveraging AI involves understanding and applying a *collection* of tools, which are not always obviously related in how they work or are deployed.

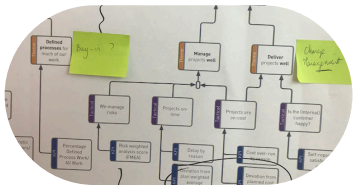
Artificial Intelligence, the concept

Artificial intelligence is a field of computing focused on machines that are capable of performing tasks that typically require human intelligence. Those tasks might include reasoning, problem-solving, learning, understanding language, or interpreting an environment.

For this guide, we will first look at the capability of each of the types of AI tools, then look at how these can be applied in the field of KPIs, business intelligence, and analytics.

So, what types of AI technologies should we consider?

- **Language Models:** Systems able to understand, generate, and manipulate language in a way that feels human-like.
- **AI Search Engines:** AI applied to providing more contextual, personalized, and relevant results based on user queries and intent.
- **Image Generation:** AI-powered tools that can create, edit, or manipulate images based on text descriptions or other input.
- **Video Creation:** AI technologies that automate aspects of video production or generate video content based on large training data sets (tools such as OpenAI Sora).
- **Voice and Speech AI:** Systems that can understand and generate human speech.
- **Code Generation:** AI-powered tools that can generate, complete, or suggest code snippets based on natural language descriptions or existing codebases.
- **Data Analysis and Insights:** AI systems that can process and analyze large datasets to extract meaningful patterns, trends, and insights for decision-making.
- **Predictive AI:** Technologies designed to forecast future events, behaviors, or outcomes based on historical data and patterns.
- **Computer Vision:** Systems trained to interpret and understand visual information, enabling applications like object detection, facial recognition, and image analysis.



02. How can AI help me with my KPIs?

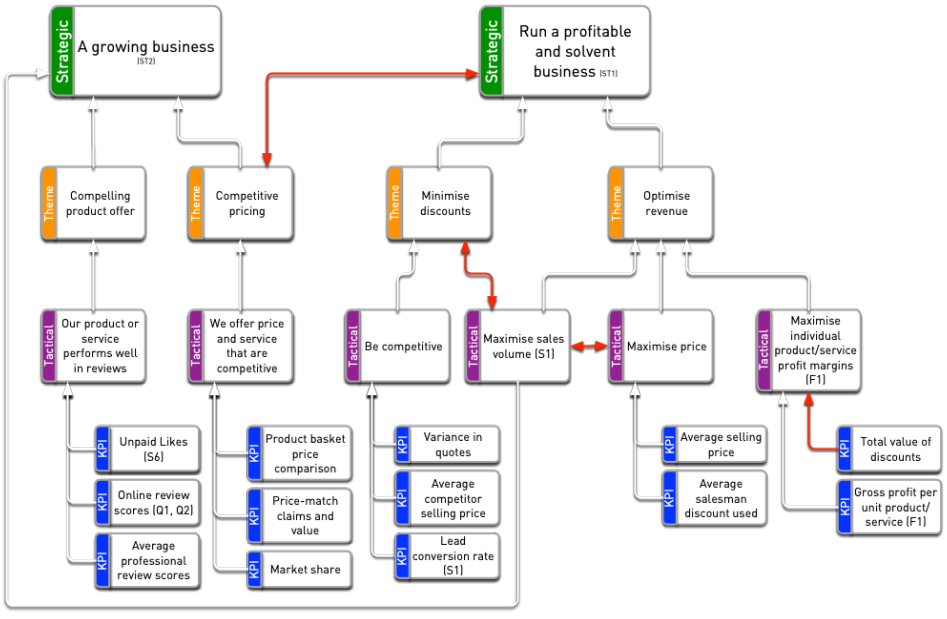
Now we can focus on how the technologies can be practically applied to the world of KPIs, performance measurement, analytics, and decision-making support.

Some of the applications described below exist right now; the technology is mature and they can already be extremely useful. Other technologies may not be useful yet but may well become valuable (or even essential) in the medium to long term as they mature and we learn to harness them.

Strategic planning and design

Expressing our objectives and the outcomes that will deliver them

The cornerstone of meaningful performance measurement is to understand what outcome, goal, or objective you're striving to achieve. To do this, we need to develop an initial set of high-level objectives and break those objectives down into meaningful and comprehensive sub-objectives, then link those sub-objectives to potential KPIs. You can achieve this by using methodologies such as KPI Trees[2] or strategy maps. Here's an example of a simple KPI Tree:



Many people find this process unfamiliar and challenging. Fortunately, language models such as ChatGPT, Claude AI, and Google Gemini can help with creating strategy statements and identify the drivers of those strategic objectives when well-prompted.

Although these tools can be very useful, do be careful. It's well publicized that these models are prone to hallucination, can create misleading statements, and can also miss certain drivers. Despite these risks, language model AIs can still be a helpful tool for generating ideas for review, discussion, and editing.

Helping us choose *what* to measure (KPIs)

Once we've broken down our strategic objectives into a handful of sub-tiers of outcomes and results using our KPI Tree, the next step is to decide what to measure. Large language models can be useful for developing a list of candidate KPIs for each planned result or outcome, a process that's referred to as **long-listing** in the Results-Oriented KPI System (ROKS) method for KPI design. You can ask an LLM to provide a list of potential KPIs for a particular result, making it clear the kind of business outcomes you want to achieve. Prompts which outline the positive outcome, stating that outcome *as though it has already happened* using active first-person language work best.

An example prompt that will generate useful outputs from most LLMs...

> *Identify the drivers for **'Your outcome here'**. State the drivers in active, first-person language as though the outcome has already happened, for example 'Our payroll runs are timely and error free'. Use between 5 and 12 words. Talk about outcomes and results, not actions and activities.*

Generating 'Key Performance Questions' (KPQs)

Key Performance Questions (KPQs[3]) are the questions we need to answer using our metrics (KPIs) to understand if we are moving toward the strategic objectives we set for our organization. KPQs are valuable in designing both our review structures (for example, meeting agendas and meeting "terms of reference") and also in deciding **what** KPIs go in our reports and how to structure those reports in a logical and helpful way.

Again, language model tools can be useful for generating lists of key performance questions (and, again, we need to treat this list with caution, not just accepting it at face value, but rather using it as an input to the selection process).

"AI, in the form of machine learning and visual recognition, unlocks the ability to translate this unstructured data into structured, queryable information."

Gaining Insights from existing data

The challenge for many modern organizations is no longer data gathering; it's extracting insight from the volume of data that their digital systems produce.

This is an area where AI is already useful and only likely to become even more valuable over time. AI can help us with:

1. Extracting data from unstructured sources
2. Querying data using natural language
3. Predictive analytics

Extracting trend insights from historic data (especially unstructured data)

Many organizations have vast reserves of unstructured data. Think of call recordings, scanned documents, and unstructured PDFs. This data is often viewed as inaccessible for reporting and analysis but can offer unparalleled insights when unlocked.

AI, in the form of machine learning and visual recognition, can help translate unstructured data into structured, queryable information. For example, a UK-based carbon accounting firm using AI to analyze publicly available environmental PDF reports from organizations worldwide, converting those inconsistent PDF HTML files into consistently structured JSON files, which then become part of a global carbon database.

This capability can help unlock new data from materials we may be obliged to store (for example, call recordings or scanned letters). AI can also be applied to draw insights from the high volumes of historic data that exist in many organizations, much of it stretching back into the pre-digital era. For many AI tools, their performance and insights scale with the size of datasets available.

Examples of extracting insights from unstructured data:

Contact Centers: Extracting customer sentiment and call outcomes from call voice recordings. Machine learning and voice recognition technology can look for phrases and tone that indicate the emotional state, customer satisfaction, and problem resolution success rate, potentially in real-time.

Healthcare: AI may be used to analyze unstructured data such as historic medical records (including free text) and imaging data to help extract insights for patient diagnosis and treatment planning. This approach can support the identification of patterns, diagnosis performance, and the prediction of patient outcomes.

Finance: AI tools process unstructured data from news articles, social media, and financial reports to support the prediction of market trends and inform investment strategies.

"The power of this class of tool is the dramatic reduction in question-to-report production time…this is definitely 'one to watch'."

Querying data using natural language

In larger organizations, you'll typically find entire teams devoted to the challenge of taking raw data and shaping it into reports and dashboards that answer critical questions. Not only is this process resource-intensive, it also lengthens the production cycle and adds layers of confusion and miscommunication to the analysis process. Think of it as playing chess by mail.

A powerful class of tools is emerging that translates natural language questions such as "How is our eastern region performing for sales this month?", and delivers ready-to-use reports and dashboards with little or no human intervention, beyond the person asking the questions.

If you've already used this class of tool, you will know that the demonstrations are often impressive, but the reality can come up short. However, in the same way that speech recognition in the 1990s began as an exciting but flawed technological novelty that has become an indispensable part of most people's daily lives, natural language querying of data will likely rapidly mature into a non-negotiable part of most organizations' analysis landscape.

The power of this class of tool can be a dramatic reduction in question-to-report production time, allowing users to experiment and explore in a way that just isn't possible when submitting formal requests to an internal MI/BI team. This is definitely 'one to watch'.

Predictive analytics

It's common to describe KPIs as either "leading" or "lagging" indicators. Lagging indicators are the most readily available type of metric in most organizations. Lagging indicators focus on what has already happened. For example, profit, contract cancellations, and sales are all lagging indicators.

Though very important, a limitation of lagging indicators is that they only tell us about what has already happened. This presents a challenge. When running an organization, would we rather know a customer has canceled their contract or know that they are unhappy and *intending* to cancel their contract? Leading indicators allow us to change course and are often highly actionable.

Predictive analytics is the application of technologies such as machine learning and statistical modeling to large historic datasets to identify patterns and relationships that give us foresight of what may happen in the future. Predictive analytics enables us to translate lagging data sets into leading indicators. Although predictive analytics has existed for decades AI tools have opened up new possibilities for this branch of analytics in terms of speed, power, and flexibility.

Examples of the application of AI predictive analytics

Netflix: Netflix uses AI and machine learning to analyze user data[4], such as viewing history and search queries to predict and suggest content that users might enjoy with the ultimate goal of reducing subscriber churn. They also use this data to drive content production decisions.

Amazon: Amazon uses predictive analytics extensively to predict customer preferences and offer personalized recommendations[5], to optimize supply chain and logistics operations, and to manage inventories in anticipation of demand.

American Express: Amex uses AI predictive analytics to detect fraudulent activities in real-time and to mine historic transactional data to detect fraud[6].

AI in the form of machine learning can be particularly powerful at spotting patterns and relationships between apparently unrelated variables. While this can appear almost magical, it does raise certain challenges and risks.

Even if we identify a correlation between two data sets, we need to be a little cautious about the *meaning* of this relationship. Analysis shows that there is a strong correlation between margarine consumption and divorce rates in Maine and also between whole milk consumption and marriage rates in Mississippi. Does this mean that discouraging margarine consumption in Maine and promoting milk sales in Mississippi would lead to more happily married couples in those two states? Probably not.

Secondly, it may be hard to spot errors and issues in the output of a machine learning model. For this reason, it's always important to have an alternative method for validating the outputs of machine learning predictive analytics.

AI systems trained by expert radiologists have been shown to have high accuracy rates, but we should be careful about depending **entirely** on those AI models for a couple of reasons. First, they will need training if they encounter new diagnostic situations, so we need to retain that human-based capability. Second, we need a validation mechanism so we can remain confident that the model has not become corrupted and does not have unexpected biases or hidden errors. This is particularly true in high-stakes situations like medical diagnosis.

Machine learning-based predictive analytics can be hugely powerful, but it is important to be mindful of the limitations of the approach and to have tools and methods to audit and verify the models and outputs regularly.

03. What are the risks?

All technologies come with risks, and there's been particular media focus on the risks associated with AI—perhaps we can thank Terminator for the more pessimistic predictions. In practice, the risks around AI and measurement are a little less dramatic, although they can still have major implications.

Potential risks in using AI for producing management information include:

Data Quality Issues: Although AI can play a role in helping clean and improve data, input data quality will have a major impact on AI model performance.

Model Risk: If the AI model's assumptions and methods are flawed or biased, the outputs of the models will be flawed.

Automation Bias: The tendency to over-trust or rely on automated decision-making systems. Studies have shown that many people, when presented with contradictory information, will prefer machine-generated advice and information, even when it is wrong.

Lack of Explainability: The architecture of many AI systems means they function as "black boxes." While the output may be shown to be correct much of the time, it is not possible to audit their decision-making process, making it difficult for managers to understand **how** decisions are made. This can create problems with trust and accountability in decision-making processes.

Bias and Discrimination: An AI system trained using biased decisions or data will reproduce or exacerbate that bias.

Security Risks: Because AI relies on the quality of the input data, it can be vulnerable to "data poisoning" (where malicious or flawed data is introduced into its training set) leading to manipulated or misleading outputs.

As with any risk, we need a sensible management process. Start by understanding your organization's risk appetite, quantify those risks (using 'Failure Mode and Effects Analysis' - FMEA - for example), and systematically work to mitigate them.

04. Should we be using AI now?

Here's the challenge we face as AI moves into the performance-measurement mainstream: Some of the initial applications of AI will prove to be *less* useful than they first appear. When this happens, it can be tempting to discard AI as a "hyped" technology, but we need to learn the lessons from history.

We should expect that in the medium and long term, AI is going to have a **huge** impact on performance measurement and analytics. Some of these longer-term benefits may be predictable, but we should also expect surprising and novel applications of these technologies.

> ***"Some of these longer-term benefits may be predictable, but we should also expect surprising and novel applications of these technologies."***

So, how do we balance the risk of wasted time, effort, and cash with the importance of AI in the medium to long term? Earlier technological innovations show us that we need to:

- Understand the technology
- Experiment with it
- Be ready to adjust our application of those technologies, rapidly

One thing we can be confident of, based on previous innovations, is that the short term impact of AI will likely be overestimated but its long-term impact almost certainly underestimated.

05. Key ideas to get the most from your KPIs using AI

1. Don't delegate your strategic thinking to AI

- **Do** use it to generate ideas for KPIs and KPQs
- Be **critical**
- **Retain control** and **ownership** of your strategic direction

2. Monitor and test AI technologies but don't feel forced to deploy them unless it makes sense

- **Test** new technologies as they emerge
- **Watch** your competitors for new and novel uses of AI. You don't have to be first with a new application, but it can help to be early

3. Work on the assumption that AI KPIs may be overrated in the short term but underrated in the long term

Roy Amara observed *"We overestimate the impact of technology in the short term and underestimate the effect in the long run"* during the 1960s. This perspective gained wider recognition when Bill Gates highlighted it. The principle, now known as 'Amara's law', resonates particularly well when considering artificial intelligence's role in performance metrics. With this in mind...

- **Pace** your investment and focus
- Regard some of your work as a *longer-term R&D investment*
- In the short to medium term, look for **quick wins**, where you can apply targeted AI to a specific, nagging business problem. For example...
  - » Improved forecasting and planning through AI enhanced predictions
  - » Optimization of inventory levels
  - » Identification of financial exceptions and anomalies

Resources & References

Free resources

Goal statements	https://madetomeasurekpis.com/how-to-write-goal-statements/
KPI Tree Guide	https://madetomeasurekpis.com/building-kpi-tree/
Sample KPI Trees	https://madetomeasurekpis.com/three-essential-kpi-tree-examples/

KPI Books

KPI Checklists	https://getbook.at/kpi-checklists
Getting Started with KPIs	https://getbook.at/GettingStartedWithKPIs
GAMED: Target and Incentive Design	https://getbook.at/gamed-book

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