DIRTY DATA EXPERT

Structure Before Intelligence™

THE AI AMPLIFICATION EFFECT

Executive Brief

Gary Segal
www.dirtydataexpert.com
gary@dirtydataexpert.com

I once called for a master inventory listing, with segmentation, from one of the biggest FMCG companies in South Africa. What came back was segmented by reporting divisions. Under "Groceries" sat more than a hundred items — from a spice to cleaning material — with no segmentation between them.

Now imagine training an AI on that listing and asking it to forecast demand.

As I wrote in *Dirty Data*: "Technology does not cleanse strategy. It amplifies whatever foundations already exist."

AI does not create understanding. It amplifies existing understanding.

The quality of AI recommendations depends directly on the quality of the structures used to organise business information. Where those structures are weak, fragmented or inconsistent, AI simply accelerates poor assumptions at a scale humans cannot match. Where they are strong, AI becomes a powerful engine for operational insight and decision support.

The question is not whether your organisation has implemented AI. It is whether AI can understand the organisation it is attempting to analyse.

Why Segmentation Matters

Every organisation creates data. Very few create understanding.

Cleaning the data is the biggest mountain most organisations will ever climb. Segmenting it is the exercise everyone finds boring. But here is the part nobody wants to hear: if you don't understand your customer — and what business you're actually in — you can't segment your inventory to grow your most profitable customers. The client profile that matters is the one with the biggest basket spend, and knowing what to upsell them.

Segmentation answers the questions AI cannot answer for itself:

- Which products behave similarly?
- Which customers buy in the same patterns?
- Which categories drive profitability?
- Which items display predictable demand?
- Which products need different replenishment strategies?

Without these structures, AI has no reliable context for any decision it makes.

Understand this: segmentation is not a refinement. It is mandatory. The relationship between products — what behaves like what, what substitutes for what, what is bought with what — cannot be discovered from transaction data alone. It must be declared, explicitly, before AI can use it. Every "insight" an AI produces about product relationships without that structure is an artefact of the filing system, not the business.

If Segmentation Is Weak

When segmentation is poorly designed, unmanaged or inconsistent, AI amplifies the confusion — fluently, confidently, and at machine speed. A study of 53 AI practitioners found "data cascades,"

compounding downstream damage from data issues, in 92% of cases examined.

Category confusion. The FMCG listing: products that should be analysed separately, combined — because the segmentation followed the finance department's reporting divisions rather than the products' behaviour. AI trained on that structure learns relationships that don't exist and generates recommendations that mislead with confidence.

Conflation. A hardware store ran screwdrivers from different manufacturers — different attributes, different costs — under a single stock code, on the same peg. One code, many products: demand signals blended beyond recognition, forecasting accuracy destroyed.

Pricing errors. Those same screwdrivers carried the same selling price but returned different gross profits. The uniform price hid completely different margins. AI pricing on that data looks mathematically sound and is commercially wrong. At scale, this is how a Zillow happens: more than $380 million lost in a single quarter and up to $569 million written down when the pricing models met reality.

Weak forecasting assumptions. Historical demand contaminated by classification errors. The system optimises noise and calls it a forecast.

The Hidden Executive Risk

Many AI implementations fail quietly. The model looks sophisticated. The dashboards look impressive. The recommendations look credible. Yet the underlying business remains misunderstood.

That is executive illusion: decision makers gaining confidence in recommendations built on an inaccurate interpretation of the business. And it compounds — the greater the automation, the greater the impact of the structural weakness. Bad data costs the US economy an estimated $3 trillion a year, most of it in quiet failures rather than spectacular ones.

If Segmentation Is Strong

Where meaningful segmentation exists, AI stops amplifying confusion and starts accelerating intelligence.

Forecasting. Demand patterns identified accurately. Forecasts become stable and actionable.

Replenishment. Inventory decisions align with actual product behaviour. Availability improves while excess declines.

Inventory optimisation. Different demand profiles get appropriate stocking strategies. Capital allocation improves across the portfolio.

Pricing analytics. Genuine pricing opportunities identified from behavioural characteristics, not simplistic averages.

Executive insight. Leaders finally see who their most profitable customers are — and what to sell them next. Decisions get faster, more consistent, and more evidence-based.

No human can hold the relationships between thousands of products, customers and transactions in their head. Segmentation creates the structure. AI scales that structure. Without the first, the second

only scales the mess.

Executive Conclusion

Before asking "How do we implement AI?", executives should first ask "Can AI understand how our business is structured?"

AI success rarely begins with model selection. It begins with organisational understanding. The organisations creating the greatest value from AI are not necessarily deploying the most advanced algorithms. They are building the strongest foundations.

Segmentation is not a reporting exercise. It is the operating system of modern decision making.

And when the structure is weak enough, the failure doesn't stop at bad recommendations. The agents stop asking and start acting — which is the subject of the next brief, *When the Agent Acts*.

Gary Segal is the author of "Dirty Data" and "Switching ERP for Embedded AI". He writes the weekly Structure Before Intelligence™ executive brief at dirtydataexpert.com.

Sources: Kentaro Toyama, "Technology doesn't cause a fixed benefit wherever it's used; rather, it amplifies underlying human forces" (The Korea Times, 2016) and "AI amplifies the good and the bad in society" (U-Mich School of Information, 2023); Thomas C. Redman, "Bad Data Costs the U.S. $3 Trillion Per Year" (Harvard Business Review, 2016); Sambasivan et al., "Data Cascades in High-Stakes AI" (Proc. CHI 2021) — 92% prevalence across 53 practitioners; TechCrunch, "Zillow iBuying exit" (2021) — $380M+ Q3 loss, up to $569M writedown.