

# Resistance is futile: How corporate real estate companies can deploy artificial intelligence as a competitive advantage

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## ABSTRACT

Corporate real estate (CRE) typically adopts new technology at a slower pace than other industries. Those CRE service providers that are, however, able to effectively integrate and adopt artificial intelligence (AI) and AI techniques such as machine learning (ML) into pre-existing data structuring workflows will enable new customer analytics and standards for service that will elevate customer expectations. Specifically, AI will emerge as a competitive advantage for CRE service providers that are able to overcome two primary obstacles for effective integration and adoption: the fear of automation displacing human workers, and access to byzantine data stores across the CRE asset class. This paper presents best practices for surmounting those obstacles and analyses a test project that deployed machine learning artificial intelligence (ML-AI). Early results of this project show that AI enhances the productivity of data-structuring workflows, enabling customer analytics derived from legacy (paper-based) contracts within CRE by quickly converting these contracts into structured digital datasets. Furthermore, well-designed ML-AI solutions can make an immediate impact



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*on top-line revenue growth by unlocking valuable information previously buried in legacy contracts for key clients. The project itself employed an ML-AI solution to abstract paper leases 39.2 per cent more quickly than an entirely human-driven process; however, the productivity gain alone is not the main reason why this specific application of ML-AI was chosen for the programme. Abstracting (ie structuring) the data contained in leases is critical to the digitisation of CRE as an asset class. Once digitised, further ML-AI applications can glean greater insights from the abstracted data, unleashing a deeper understanding of the value in the marketplace for CRE service providers. Most lease contracts are still recorded in paper or PDF and require a human abstract to become structured data. Consider the distinction between CRE and financial markets: CRE incumbents use the equivalent of physical stock certificates. Lease abstraction is therefore necessary to move from the current analogue system to a digital one that enables a high-speed, frictionless, data-driven marketplace.*

**Keywords:** *artificial intelligence, machine learning, data structuring, competitive advantage, early adopter advantage*

## INTRODUCTION

During the last decade, industry incumbents previously believed to have deep competitive moats have been overtaken by new entrants such as Uber, Amazon and WeWork. Equity funding for disruptive ideas has now turned its focus to CRE, signalling a new era of innovation. It is in this context that well-established CRE firms must consider adopting new technologies lest they go the way of Blockbuster and Sears. Start-ups such as VTS are gaining in market share already by incorporating artificial intelligence (AI) and machine learning artificial intelligence (ML-AI) across a spectrum of workflows. Legacy firms risk losing competitive advantages if they are unable to understand the

benefit of these methods and incorporate them into their businesses.

Realising AI's potential upside is not easy for these legacy CRE service providers. In a recent poll of 300 CRE industry executives, 68 per cent are implementing big data projects, but 89 per cent face substantial impediments.<sup>1</sup> One key challenge is siloed, unstructured datasets required to teach and power effective AI solutions. The time required to compile data and train an AI may be a distraction for companies that need to demonstrate short-term results in the very competitive and well-established CRE industry. Without immediate and tangible benefits, leadership teams may discount the value of time invested in establishing ML-AI processes that will later become advantages.

Fear and resistance to change is a second challenge that AI projects face, as AI has frequently been presented in the media as a 'job-killer'. Even the most well-intentioned teams responsible for conducting tasks that can now be enhanced by technology will be somewhat resistant to the prospect of embedding workflows that they believe jeopardise their livelihood. For companies to be successful in deploying AI, it is important to communicate to stakeholders that this technology is a tool that augments and enhances existing intelligence, experience and capabilities, rather than a means of replacing humans entirely. Effective leaders must show how ML-AI delivers greater value to clients and drives a higher rate of growth for the company by communicating the 'wins' it generates. Careful attention must also be paid to selecting a suitable use case to prove ML-AI's efficacy. Starting with a small, targeted use case and building on those capabilities helped the company in the case study to reduce internal resistance.

Regarding the technology that underpins ML-AI, incumbents must also choose whether to build capabilities in-house or outsource to a third party. CRE professionals must also institute processes that can most

effectively support the technology while deciding whether to outsource some or all of the process. Effective decisions require recognising which processes and technologies create long-term strategic value for a company's core business and which can be viewed as commodity services to be purchased over the long run.

### WHAT IS AI?

Modern AI has existed for well over half a century.<sup>2</sup> During the last 20 years, AI has enabled computers to outperform humans across increasingly complex problems by leveraging the rapid growth of available data and low-cost cloud computing power.<sup>3</sup> For CRE professionals who wish to effectively implement AI within their core business, it is important to understand that AI is an umbrella term which covers many different technologies and methodologies. Some key components to AI include, but are not limited to:

- *Big data:*<sup>4</sup> A significant amount of data is required to effectively train an AI. New and larger datasets bring a variety of formats such as video, photography, social media or geolocation information. Larger datasets increase the complexity of processing and structuring due to increased volume, velocity and variety. A deployment of a new sensor technology that shows occupancy across a floorplan, for example, could be reasonably straightforward, but if a company wished to match this data with geo-tagged media about a problem encountered in real time, the complexity would increase exponentially;
- *Algorithm:* An algorithm is simply a set of rules AI uses to make decisions. Typically, legacy datasets do not have the volume of data required to effectively train complex algorithms. For algorithms to be effective, they should be explainable to business

practitioners who will be required to use them and recommend them to clients;

- *Machine learning:*<sup>5</sup> Machine learning is a subset of AI that uses algorithms to 'teach' itself. With machine learning, AI can rewrite its rules based on insights it gleans. Many of the most popular machine-learning techniques are modelled on the latest understanding of how the human brain works;
- *Deep learning (DL):*<sup>6</sup> DL enables an AI-based system to automatically learn from new data. Like machine learning, it uses artificial neural networks (NN), although deep learning's NNs incorporate more data. These large NNs estimate greater parameters than other models for the same set of input variables, thereby potentially providing better insights, but require large datasets to train properly. In the following case study, the third-party technology provider's AI is deep learning based.

A greater scale in structured datasets is necessary to achieve peak performance of ML algorithms. Time must be invested to structure disparate datasets for CRE service providers. The theoretical payoff of this investment is to bring solutions to market

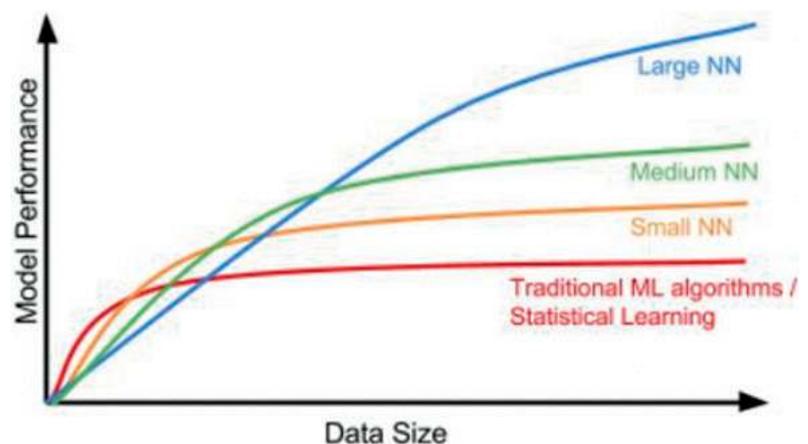


Figure 1 Performance of the model vs dataset size  
Source: Weng<sup>7</sup>

first and control IP for proprietary algorithms that drive ML-AI learning. If the data structuring and development of ML-AI algorithms are fully outsourced to a third-party provider, that third party will have trained their AI and develop IP by leveraging the CRE service provider's data.

## AI IN COMMERCIAL REAL ESTATE

Sales professionals sometimes erroneously present new technology as AI. True AI systems take a significant time investment to produce actionable insights materially faster than pre-existing workflows.<sup>8</sup> Start-ups that have effectively developed and deployed true AI have received an increasing amount of venture capital (VC) investments. During Q3 19, the leading VC in the CRE technology space closed the largest 'PropTech' fund in history,<sup>9</sup> further underscoring the potential for disruption that CRE incumbents face. AI-enabled companies in CRE can add value in areas where independent databases are brought together to augment existing functions with AI-enabled equivalents.<sup>10</sup> Such innovations are already taking market share from legacy service providers, indicating that the market will favour companies that are able to integrate AI going forward. Some recent examples of early stage funding business that are incorporating AI in their business model include:

- *Truss — AI-enabled brokerage advisers:* The online property marketplace Truss<sup>11</sup> caters to small and medium businesses. Truss deploys an AI-powered chatbot, Vera, to interact with clients and collect key information on what they need from a space. Vera provides tailored recommendations by ranking the suitability of options, freeing up staff to focus on closing the deal rather than sorting through listings;
- *Skyline — AI-enabled appraisal and valuation:* Well-trained AI presents the opportunity to enable faster decisions

while incorporating more data into a recommendation than a human brain possibly can. Skyline similarly claims to be able to make predictions almost instantly using over 10,000 data points.<sup>12</sup> What this start-up is doing is taking previously unstructured and disconnected information sets and teaching AI to incorporate this data in the calculation of a property's price;

- *Cherre — AI-enabled data marketplace:* A lack of uniformity in data within the CRE industry — and lack of access to data — are the greatest technical obstacles for the adoption of AI and ML-AI in CRE. Cherre currently provides AI-enabled solutions to consolidate, manage and clean the fragmented data endemic to the industry, allowing large companies to fully leverage the value of their software.<sup>13</sup> With all their data in the same format and place, Cherre users will have built a foundation for an AI-enabled business.

A strong and digitised data foundation is integral to the larger digitisation of the CRE industry, as the challenge of data fragmentation must be surmounted in order for any digital advancement to take place in the industry. The value of CRE in the US alone is about US\$12tr.<sup>14</sup> This massive, physical, contract-based asset class has access to an incredible amount of data currently sitting unused on paper leases in filing cabinets across the world. A digitally connected marketplace would allow faster and more transparent decisions, as shown in the case study below. Once more lease data is digitised, AI will assist in more effective structuring of lease data, which is critical to unlocking such transparency. Enhancing legacy lease abstraction workflows by deploying AI is not just a means to experiment with AI, but rather a foundational starting point for the digitisation of the CRE asset class.

## A CASE STUDY: AI DEPLOYMENT AT A CRE SERVICES PROVIDER<sup>15</sup>

Incumbent CRE service providers face several choices concerning AI technology and its critical support processes. A survey in the Harvard Business Review<sup>16</sup> found that 90 per cent of companies that had successfully implemented AI spent at least half of their budget on integration, including redesigning workflows, communicating goals and training staff. The support processes are where humans train ML-AI algorithms for a task, ultimately creating a competitive advantage. In deciding what to outsource, companies should value these processes appropriately. Embedding an effective review and learning process will have an impact on the adoption and efficacy of an AI solution.

This project paired a third-party ML-AI solution for reading and abstracting data from leases with an internal review process and learning loop. The goal was to efficiently gather and structure data from paper leases to drive customer insights and analytical tools. The data gained from the process proved valuable in validating concept products marketed to the CRE company's clients. This project also demonstrated best practices for working with ML-AI across critical data structuring processes, deepening institutional knowledge for future innovations. Additionally, AI-powered analytics show promise for providing high speed market-driven insights for future clients, thereby helping win new business. The CRE company at hand focused on growth as opposed to cost reduction, which helped gain buy-in from key internal stakeholders. Internal buy-in is critical to successfully comparing new AI-enabled solutions with their legacy equivalents. Some of the key workflows are outlined below:

- *Raw data conversion:* Hard-copy leases must be scanned and labelled by client and document type. This can be accomplished

in-house by a person with basic administrative skills. Execution of this step works best when leases are already organised properly. Once scanned, data can be abstracted;

- *Optical character recognition (OCR):* OCR converts scanned text into computer-readable and searchable text like a human-to-computer translator. OCR technology is cost-prohibitive to build from scratch in-house, but relatively cheap to outsource. As there is well-established OCR technology available, this CRE company relied on a third-party tool to execute the OCR step;
- *ML-AI data structuring and external review:* If OCR is the human-to-computer translator, then ML-AI is a computer-to-human interpreter. The ML-AI reads the OCR output and understands that a certain character string should be labelled as a 'tenant use restriction', for example. Then the ML-AI can indicate whether this 'tenant use restriction' applies to parking, after-hours use, modifications, etc. As deep learning is employed, the abstractions get continuously more accurate with proper training. ML-AI development can be cost prohibitive to insource as it requires hiring highly in-demand experts. In this test pilot, the CRE company partnered with a third-party provider that built a digital workplace which allows human review of the first round ML-AI abstraction. The CRE company outsourced this first review and but used internal teams to perform a second round to optimise accuracy;
- *Internal review and feedback:* High-quality reviews of the ML-AI output are essential for taking advantage of this technology's ability to learn. If a company conducts a poor-quality review, then ML-AI will fail to improve over time. The CRE company decided to keep the final review process in-house to assure the step is conducted properly and a full causal understanding

of any inaccuracy drivers is embedded in its workflows;

- *Initial results:* The test pilot results showed that the efficiency gains through ML-AI were significant. Total time spent abstracting a lease was reduced by 39.2 per cent, excluding the one-time training of outsourced reviewers.<sup>17</sup> This increased in efficiency translated to a 64.4 per cent productivity gain for a lease abstractor working an eight-hour day.

This productivity gain was, however, only a small component of the benefit of incorporating ML-AI. The test pilot also helped deliver new insights almost immediately. During the test pilot, the CRE company became aware that a global client seeking a relocation in a major US city was concerned that a prospective landlord would not finish construction before the end of its current lease, thus exposing the client to holdover penalties. The CRE company was able to

use the ML-AI workflow to quickly evaluate hundreds of leases to quantify average landlord penalties for failure to deliver space on deadline in that market. This fact-based analytic gave the negotiating team a range and benchmark to guide the negotiation process with the counterparty and the transaction was executed with a clause that was satisfactory to both parties due to the transparent nature of the data provided.

Combining the local market expertise of the negotiating team with the rapid analysis of a huge dataset reassured the CRE company's human assets that their expertise was not being replaced, but rather enhanced by the AI capabilities.

## TEST PILOT LESSONS LEARNED

### Overcoming obstacles

Although the test pilot involved a fairly simple deployment of ML-AI within a legacy

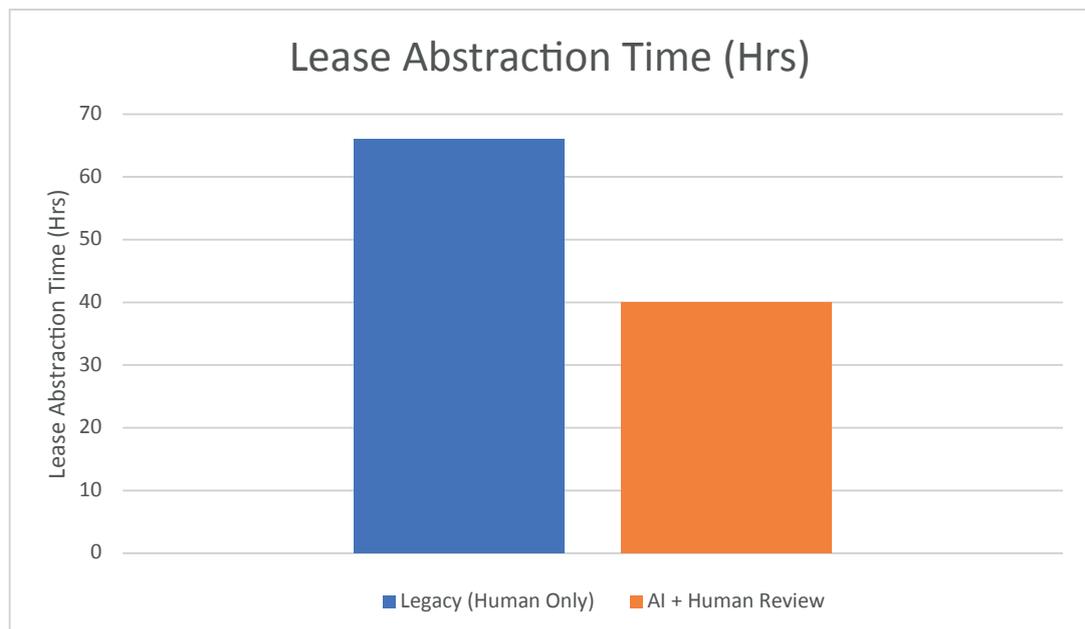


Figure 2 Improvement in abstraction time when legacy systems are supplemented by AI (note: shows reduction [39.2 per cent] in lease abstraction time of one lease abstractor abstracting data from 30 leases)

Source: Ezell and Esposito<sup>18</sup> and Ryklin<sup>19</sup>

lease abstraction workflow, the project illuminated the potential of ML-AI in helping navigate the fractured datasets native to CRE, found ‘quick wins’ for ML-AI that enhance client analytics, and validated the framing ML-AI as a productivity gain rather than a cost-reduction initiative. To support future implementations of AI in CRE, the CRE company found that effective communication of wins, and framing ML-AI as a growth enabler rather than a cost minimisation function, was essential to overcoming organisational resistance to adoption.

### **AI project planning**

CRE companies seeking to employ ML-AI solutions may make different choices depending on their specific use case and organisational structure. All should note that AI should not be employed for AI’s sake and will require executive level buy-in to ensure teams understand why these initiatives are critical to the core business. Outlining a specific goal for the technology, carefully planning each step, and developing new metrics to measure success are best practices for any AI project. In this case, establishing a clear internal use case meant the project was easily explained to multiple stakeholders across the business.

### **Outsourcing processes and technologies**

Early in the planning process for an AI solution, CRE decision makers should understand the distinction between processes and technologies required for AI deployment. They must assess whether they have, or desire to have, the capability to build the technology and processes in-house. Accordingly, the decision regarding whether to outsource the critical processes supporting the technology must consider a firm’s resources, market position and strategy. Outsourcing may simplify and reduce time investment but also may build a strategic capability within a third-party organisation. Without

appropriate controls in place for Internet protocol (IP) transfer, this may present a long-term strategic risk to an organisation.

### **BUILDING FOR THE FUTURE**

ML-AI techniques will still require good human supervision and quality assurance to instil confidence in the analytics being presented to end users. A well-designed ML-AI system acts like a ‘pulley’ for the human teams in that it can carry a large portion of the load, but still requires human users to get the best output.

Enterprises implementing ML-AI will inevitably face organisational and technical obstacles to successful deployment of this technology. There will likely be trepidation within teams that perceive risk to their livelihood from the successful implementation of AI workflows; however, leaders stand to benefit greatly from AI when they view the technology as an enhancement to amplify existing expertise of CRE professionals.

In this test pilot, the speed of the AI-enabled process translated to speed in validating and analysing complex unstructured data. That advantage translated into a competitive advantage for the CRE company’s existing advisers. It also built added capabilities in connecting dots across new markets and existing clients to win business. Focusing energy on driving these new wins helps to build the business case for supporting experimentation with AI across the organisation and to reduce fears of automation.

CRE executives must decide whether to invest resources now or wait and adopt proven processes later. In the traditionally conservative CRE space, many established companies might understandably choose the latter. The business case for adopting ML-AI now is to start developing technologies and processes that will drive customer insights. CRE companies able to ensure development and control of ML-AI review will effectively

control valuable IP and learning loops to drive innovative insights for their customers.

A wait-and-see strategy may be best for firms that plan to use M&A-driven or joint-venture strategy to acquire these algorithms and process. They should, however, be wary of the fact that when an algorithm is trained to solve a given task, it cannot be easily redirected to another.<sup>20</sup> If a CRE company acquires, rather than builds, AI capabilities, it is depending on its competitors and relying on the quality of their processes to train the AI. This option may be as risky as devoting the time investment necessary for early adoption of this technology.

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