



WHAT GOOD RENTAL HOUSING BI LOOKS LIKE

Getting Actionable Insights From Your Data

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INTRODUCTION

The demand for good business intelligence (BI) solutions is growing exponentially today. For an industry that still has associates who remember tracking physical guest cards in those green metal boxes, technology has rocketed us into an environment where we are often drowning in data yet struggling to get actionable insights.



This “data rich, actionable data poor” paradigm is driven by an explosion in the number of real estate technology (RETech) solutions, each with its own set of data, some of which integrates well with other systems and some of which stays quite siloed. Add to that the fee management model (representing more than two-thirds of professionally managed rental housing) where an owner’s portfolio technology stack is often spread amongst multiple different property management systems (PMSs), CRMs and other technology tools, and you have a very complex and cumbersome data environment.

The key to good decision-making in such a world is a BI platform that can extract data from multiple systems of record (SORs), transform that data into a normalized model for the entire portfolio and then load that into a “single source of truth” (SSOT)—a data warehouse with an associate reporting and visualization layer that serves as a “one stop shop” for all analytics.

So why does the industry struggle to get such a solution? Let’s look at the root causes of that challenge before moving on to describe more completely what a good BI platform looks like.



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WHAT'S WRONG WITH MOST BI TODAY

Until now, operators have faced limited choices:

- Build reports by collating data from various SOR reports or extracts
- Build a bespoke BI platform
- Use an "off the shelf" solution, typically offered by their PMS



BUILDING REPORTS FROM COLLATED DATA

Based on our experience, this is the choice that most operators have made. As the BI Maturity Figure below shows, this is somewhere in the Era 1 and Era 2 world. The good news is that users are able to create and get reports; the bad news is that it's highly manual, often constraining and almost always frustrating. Without a real BI platform, it only gets worse. As spreadsheets proliferate, they become more mission critical... and they also become more prone to errors or differences across the various data silos.

Signs that you are feeling pain from this approach include:

- Multiple reports have different numbers for the same metric (e.g. occupancy, availability, ...)
- It feels like you have an "army of analysts" to do basic reporting, both internally and to other key stakeholders
- It's hard (or impossible) to get data to support some key decisions

BUILDING A BESPOKE DATA PLATFORM

While overall, most operators choose the first option, this approach is the choice of the majority of large (>30,000 homes) operators. These operators have the resources to invest in such a large (and expensive) undertaking and often

A good BI platform allows users to see what is important to them for making business decisions.

chose this path based on the lack of other credible alternatives for them.

There are many advantages to this approach, particularly in the areas of control and flexibility. However, there are several challenging obstacles to anyone just beginning to embark on this approach:

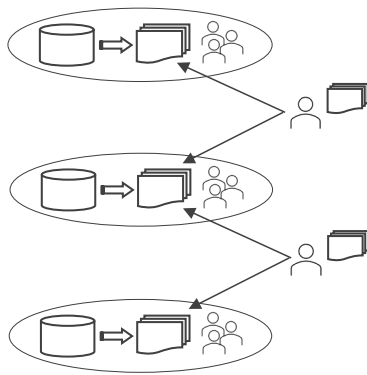
- Projects of this type typically take 2-3 years to come to fruition
- Large bespoke BI platforms easily cost \$2-3M (or more)
- Companies take on material technical debt. This manifests itself when limited or no resources are available for a "version 2"
- These projects are rife with total cost of ownership (TCO) "traps": Ask any COO or CEO who embarked upon a bespoke BI project to share the difference between what they thought it was going to cost and what it actually cost, and you'll hear quite a tale.

BUY OFF THE SHELF (OTS) SOLUTIONS

Historically, most of the OTS solutions have been offered by the various PMS vendors. While definitely providing capability more robust and stable than the spreadsheet world of data collation, these solutions have material limitations:

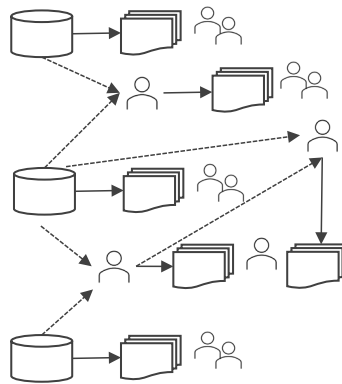
- These platforms are not the true "single source of truth" (SSOT) that business users need. The result is that most users either limit their use or they end up downloading various reports from the platform into another system (usually Excel) and running analyses there.
- These solutions typically offer limited flexibility in building dashboards. They offer a somewhat paternalistic approach where users get the dashboards designers thought they needed. Users may be able to move

Era 1: Silo'd data



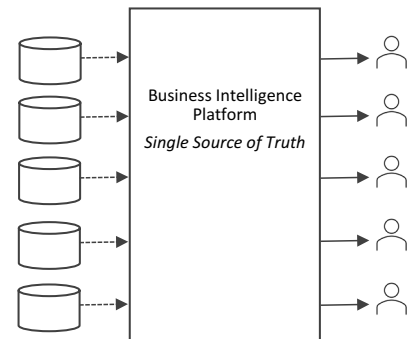
- Standard reports from transactional systems
- 3rd party tools used to visualize
- Data exchange constrained by silos
- Highly manual
- Spreadsheets & "spreadmarts"

Era 2: Overlapping Data



- "Islands of BI" become pervasive and overlap
- "Spreadmarts" and datamarts become more mission critical
- Multiple versions of the truth with no easy way to synchronize
- Automation provides some relief but doesn't solve core problems

Era 3: Coherent BI



- Strategic data modeling
- Driven by the business, not technology or tool choices
- BI portfolio matches appropriate tools and views to user roles (execs, mid-level, site, support, ...)
- More time spent analyzing than acquiring and massaging data

tiles around or otherwise affect the cosmetics, but it's typically hard (or not possible) to change the size, modality (e.g. chart vs table) or otherwise create their own visualizations

- These environments typically lack super user access for ad hoc queries. A robust BI platform not only offers a strong suite of published dashboards for end users, but it also offers power users direct access to the entire data warehouse to conduct ad hoc analyses. These are the kinds of analyses needed when there are questions not easily answered by the published dashboards. Frequently, these ad hoc analyses lead to useful insights that executives want to share more broadly, thus motivating the creation of new published dashboards
- Some of these systems pre-aggregate some data which then limits the ability to "slice and dice" the data differently as needs change in the future
- Lastly, these solutions offer limited or no data extensibility. A strong BI platform is not

static. As organizations evolve, they usually find new data sources to include in their data model. Solutions that don't allow for easy data extensibility constrain organizations in ways they eventually find to be quite uncomfortable

Given all these limitations, we often see people using these solutions as a sort of "meta-tech." Instead of being their SSOT, they download multiple reports from this kind of BI application into Excel and create dashboards there. This "meta tech" provides a valuable service in bringing some data together but ultimately leaves users still collating data and creating spreadmarts fed by this data.

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KEY ELEMENTS OF A GOOD BI PLATFORM

A good BI platform meets three key criteria:

- A strong business focus implemented by contemporary data modeling principles
- Provides users what they want, how they want it
- Meets modern "table stakes"



DATA MODELING

It may sound trite, but a good BI platform allows users to see what is important to them for making business decisions while not cluttering things up with data that isn't important at that moment and in that context. And the reality is that it takes a lot of purpose-driven effort to make this seemingly obvious statement come to life.

The first step to achieving this is to define the most important business factors worth paying attention to.

- Identify no more than about six critical success factors (CSFs), the drivers of your key business results. There are likely as many as a dozen or more "success factors," but typically no more than a half dozen are truly critical. Later in this paper, we'll discuss the four CSFs that all rental housing companies share
- Define the key performance and key results indicators (KPIs and KRIs) that make it easy for stakeholders to not only know exactly what happened (KRIs) but also what action to take (KPIs)
- Build out dashboards that make it visually easy for stakeholders to see what they need to see and take the action they need to take to drive success with those CSFs

Along with establishing the CSFs and KPIs/KRIs, a good BI platform models data based on a specific methodology. This ensures that the relationships between the data are well understood, that the data in the data warehouse will be able to answer the key business questions posed by the CSFs and reduce the overall development (and more importantly) ongoing maintenance costs. Proper data modeling comes with an added benefit that the process of creating the business model forces a company's technology and business teams to engage with each other in a collaborative fashion.

At REBA, we have embraced the Kimball meth-

odology for data modeling. This methodology defines a specific set of processes and techniques to design, develop and implement an enterprise data warehouse. Kimball is a bottoms-up approach to creating a data model and then managing the data warehouse life cycle.

While no methodology is perfect, this methodology has several advantages that are particularly appropriate for rental housing as this approach

- Typically takes less time to develop and modify data warehouses than other methodologies thus increasing speed-to-results and decreasing cost
- Uses a "star schema" approach which is easier for data analysts to understand and simplifies querying and analysis
- Is much more amenable to involving generalists and thus substantially increases the talent pool while making it easier to train associates new to the task
- Focuses integration requirements on individual business areas which is very appropriate for industry verticals like rental housing
- Is highly amenable to deepening and broadening the data warehouse as new business processes are modeled and new star schemas are added to the data model

WHAT I WANT, HOW I WANT IT

The notion that any one dashboard or report would be great for a wide range of users is a bit of a fool's errand. After more than 30 years of analytics work, we know that different clients and different users within each client have different desires; and even for the same data, some people love charts, others love tables, etc.

That's why a good BI platform has tremendous flexibility in its user interface. Different clients and users can configure dashboards however they want. This flexibility is one of the primary

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decision drivers for those who choose to build bespoke systems—it just comes at a high cost in dollars, effort and risk. However, with today's visualization and reporting technology, there's no reason for anyone to give up on this just because they don't want to build a fully bespoke platform.

Flexible user interfaces take care of the “how I want it” aspect. Good BI platforms also allow users to get “what they want.” To do this, the platform must allow for database extensibility—the ability for users to add data elements to the core data warehouse. This requires some strong technical skills, so not all users will want to do this. But for those who have the skill, it means there's no ceiling on what can or cannot be in the warehouse; and for those who don't, it's still good to know they have the opportunity to do so in the future if they want to hire the appropriate resources.

There's one final “what I want, how I want it” element to consider. A good BI platform recognizes there are two distinct types of users. The vast majority of users will consume published dashboards. These are usually the people we think about when we are discussing BI.

However, there's a much smaller, but equally important group of users. Power user analysts want complete ad hoc analysis capabilities. Think about the pricing and revenue management (PRM) associate, the financial planning and

analysis (FP&A) team and maybe some highly analytical asset managers. These are the “Excel Jocks” who typically do all of the data collation and reporting when there is no BI platform (or the platform doesn't really meet the company's needs).

Meeting these power user needs is why a good BI platform will give full access to the entire data warehouse—all the metrics and all the dimensions—allowing these power users to pull and analyze data in any way they desire. This allows analysts to answer ad hoc questions from executives and other internal customers. Frequently these ad hoc analyses result in more than just a quick answer to an important question that otherwise would have been hard to get. Many is the time that the executive receiving the answer will then ask if the analysis can be run again—next week, next month, next quarter, etc.

In the “spreadmart” world of 90% data collation and 10% data analysis, this is a painful request. But with a good BI platform, this analysis can be re-run at the press of a button—99% analysis and 1% administration. And inevitably, executives will see some of these repeated analyses and realize they should share this information with others. Thus is born the inspiration for a new published dashboard or report!

TABLE STAKES

While all the attention (and differentiation) may be on the data modeling and visualization layers, there are several “table stakes” that a good BI platform must meet:

- Access must be available 24x7x52 anywhere there's a wifi or cell data connection
- Visualizations and reports should render well on desktop or laptop devices. Given the density of data in typical dashboards, it's rare that they render well on mobile phone screens

- Modern security, e.g. disk-level data encryption, encryption for data transfers, periodic vulnerability testing, etc. is in place

BUT WHAT ABOUT THE CONTENT?

In our twenty-plus years of working with rental housing companies, we've identified close to twenty different success factors based on the wide variety of business models in this industry.

In implementing those with a dozen or more clients, we have realized that there are four particularly important CSFs that all rental housing companies share. Thus, while many BI platforms' content may vary based on individual needs, all good rental housing BI platforms have robust data content on each of these four:

- Maximize rental revenue
- Proactively manage expenses
- Effectively convert leads to leases
- Provide great customer service

There are other critical success factors that are not universal in rental housing. These include things like:

- **Acquisition and disposition pipelines.** This CSF is particularly important for the single-family rental portion of rental housing and can also be important for multifamily operators whose business focuses on acquisitions and dispositions
- **Development and lease-up.** Obviously critical for business models driven by ground-up development
- **Portfolio management.** Some owners have very complex capital structures that require portfolio management
- **Rehabs and renovations.** Critical to all value-add owners and operators
- **Mixed use.** Often a key part for operators in commercial business districts

Maximize rental revenue

- Occupancy
- Availability
- Rents (new, renewal, blend)
- Rents, change in YOY
- Rents, lease-over-lease
- Days vacant
- Days on market
- Lease expiration profile

Effectively convert leads to leases

- Leads
- Tours
- Applications
- Cancels/denials
- Move-ins
- Conversion metrics

Proactively manage expenses

- General ledger data
- Budget/forecast comparisons
- Cost per ... (turn, service request, etc.)

Provide great customer service

- Service request counts
- Service request time to complete
- Open service requests
- Survey scores
- Reputation Management

7 KEY THINGS TO LOOK FOR WHEN EVALUATING A BI PLATFORM

Data modeling. You don't need to be a modeling expert to determine whether a platform's data model is good. Simply look for the following two things:

- The platform models every metric at its most granular level. For example, occupancy and availability should be modeled at the "unit-day" level. Each data element is rather trite at that level as it's either 100% or 0%. However, modeling at that granular level "future proofs" the platform as much as any model can as it allows you to aggregate and filter data in the future in ways you may not anticipate right now. Conversely, any pre-aggregation of data risks a future state limiting your ability to "slice and dice" data differently than you are today.
- The platform creates a history of key metrics and attributes even if the system of record does not. Many SORs store parameters and some data as something called "state variables" (state variables keep track of only the current state and not any history of past states). Since BI platforms are often used to do historical analysis, users want to know what parameters and/or metrics were and how they changed over time. A good BI model will create daily "snapshot" fact tables to build that history when the SORs lack it

Flexible user interface. One of the benefits of a bespoke BI platform is the ability to create dashboards however users want to do so (and have the skill to build them). Therefore, any good BI platform should provide this capability. With contemporary data technology, there's no reason to impose an explicit link of the data model to the visualization layer thus limiting users to visualizations in a proprietary UI. Dashboards can be built in powerful visualization tools such as Power BI or Tableau and then pointed to the data model.

You don't need to be a modeling expert to determine whether a platform's data model is good.

In this way, anyone skilled in the use of those applications can customize existing dashboards or create new ones from scratch.

Extensible back end. Another reason many companies have chosen the expense, time and risk of building bespoke systems is the flexibility to extend the data warehouse whenever, and however, they want. While it's true most "bought" systems do not allow for any (or at best limited) data extensibility, it doesn't have to be that way. It's your data, so a good BI platform will allow you to extend the database as you see fit.

Published dashboards. This is where most of the value of a BI platform comes through. When building a bespoke system, these must be created from scratch. If buying a solution, then evaluate the breadth and depth of the "out of the box" functionality. These can quickly accelerate user adoption; and if the platform allows the flexibility mentioned earlier, they can also be modified to fit exactly the needs of the company.

Power-user access. Power users are those handful of associates (sometimes only one or two associates) in the company who are highly skilled with tools like Excel and are the "go to people" whenever there's an analytical question to answer. They often reside in an FP&A or PRM group or sometimes on an asset management team. While the vast majority of users will use published dashboards, there is tremendous value in these power users having direct access to the entire data warehouse, usually through a tool like Excel. This allows them to do ad hoc analysis to answer a myriad of questions. And often,

these ad hoc analyses provide sufficient impact to motivate the creation of new dashboards or reports published to share the information more broadly.

Ability to manage data that isn't in a system of record. In a perfect world, everything needed in the data warehouse would exist in a system of record and be pulled into the BI platform by an automated ETL. Of course, the world isn't perfect. There are many key data elements that exist in a spreadsheet, a word document, a pdf or just in between associates' ears. Examples of this might include date built (and/or purchased), last date renovated, construction type, etc. A good BI platform provides the ability for a "data steward" to enter and maintain important data that is not in an SOR.

24x7x52 access in the cloud. This is essentially table stakes in today's business world. Cloud providers like Microsoft's Azure or Amazon's AWS allow for sophisticated data modeling, instantaneous "anywhere, anytime" access (presuming the availability of an internet connection) while providing a wide range of security features out of the box.

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IN CLOSING

Technology has finally advanced to a point where rental housing owners, managers and operators shouldn't be prevented from getting the data they need, when they need it and in the format and modality they need it. Nor should they have to invest in a multi-year, multi-million dollar bespoke tech project rife with risk and technical debt.

Look for a system built by rental housing people for rental housing people and evaluate your options against the seven things to look for when evaluating a BI platform. Your teams will make better decisions, much more quickly and with less analytical overhead. Quite the win-win-win! **R**



ABOUT THE AUTHORS



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ABOUT REBA

Real Estate Business Analytics is on a mission to change the way the rental housing industry uses data. Founded by industry executives with real-world experience using data platforms to improve operating results, REBA currently offers two analytics products: REBA BI is a “business intelligence platform as a service” that consolidates data from multiple systems of record into one single source of truth, presenting rental housing teams with actionable insights to make smarter decisions, faster. REBA Budget is a budgeting and forecasting application that users tell us cuts their time spent on budgeting in half while improving the accuracy of their models. With REBA, you can now spend more time making data-driven decisions based on predictive analytics, historicals, and trends; and less time gathering data, or worse, basing decisions on a hunch. Visit www.GetREBA.com for more information.