
# Business Intelligence in MFH

## Creating an Analytically-driven Leadership Culture

by

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# Introduction

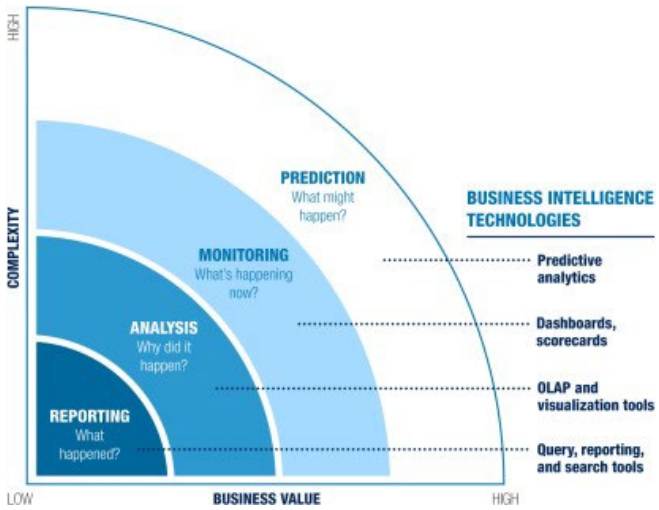
As an industry, multi-family housing has often lagged similar verticals (e.g. hospitality) in both technology and operational sophistication. That has slowly changed over the past two decades with the introduction instantaneous credit checks, automated pricing and revenue management, web-based property management systems and digital marketing strategies.

The next logical step is in the area of business intelligence (BI). Most multi-family operators want to be more data-driven in their decision process and less "gut feel" in execution but few really know how to make this fundamental transition in capability and culture. Unlike the initiatives mentioned earlier, it's also much harder to assess and measure the ROI of BI investments. How can you identify the bad decision avoided or the good decision made that wouldn't have been made without the BI system? Worse, the road is littered with BI projects that failed—hundreds of thousands, even millions of dollars wasted on each project as much work was done but few results were achieved. No wonder the industry often appears to have "champagne tastes on a beer budget" when it comes to BI.

This white paper lays out exactly what the key issues are in creating a robust business intelligence platform. Think of it as a c-suite executive's guide to what BI really is, why BI projects are complex, the reasons that many projects fail and how to guarantee that yours will succeed.

# What is Business Intelligence?

Business Intelligence is a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making. In practice, it consists of four key functions, each more complex and driving more business value than the function below it.




The simplest and most ubiquitous (though interestingly often driven the least real value) is **reporting**. Reporting tells us all about what has already happened. One of the key things about reporting is that it is very static. A key limitation to reports is that, even if they are very parameter driven, they don't allow users the ability to dig more deeply, aggregate up, etc. thus liming the insights they deliver. Also, by

definition, reports are backward looking also limits their value for forward-thinking decisions. Reporting is important (even necessary) but rarely do reports make it obvious what to do next—what to change, what to keep the same, etc. Reports, queries and search tools give us an excellent sense of current or past state and pretty much end there.

The next function up the complexity and value ladder is **Analysis**. Because analysis focuses on why things happened, it's much more valuable for contributing to making good decisions. This is the world of visualization and Online Analytical Processing (OLAP). Graphs and infographics can connect data elements and present them in a way that makes their relationships more obvious; statistical processes can be brought to bear on the data to give us a sense of how reliable those conclusions are; and OLAP tools let us explore these relationships by drilling down to more granularity, up to higher levels of aggregation and across to find relationships that weren't immediately obvious.

The critical difference between reporting and analysis is that ability to explore the data and relationships in an efficient way as opposed to being limited to a rigid view of the information. OLAP and visualization tools are key to this competency.

**Monitoring** takes us another level higher in complexity. Because it tells us exactly what is happening now, it can provide immense value by allowing us to identify issues, intervene and correct in near real time rather than waiting for a report to tell us how badly we did and the ensuing *post mortem* analysis to tell us why the bad results occurred. Dashboards, scorecards and alerts allow us to make decisions to create good results proactively and avoid bad performance before it accumulates.

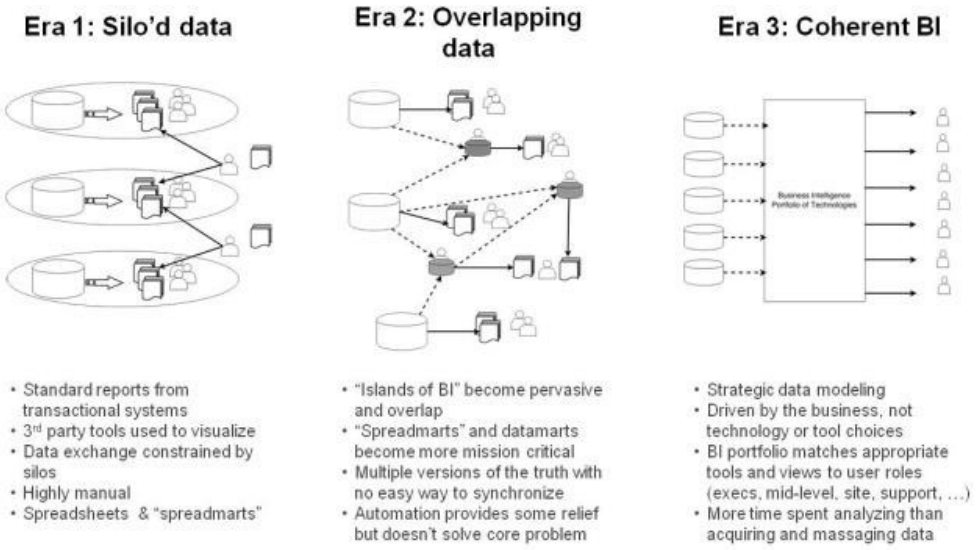
There's actually a term for this particular form of monitoring. "Operational business intelligence," sometimes called "real-time business intelligence," is an approach to data analysis that enables decisions based on the real-time[1] data companies generate and use on a day-to-day basis. This use leverages BI tools and algorithms to improve the day-to-day activities of front-line workers. Examples include tools to help control expenses, utilities, monitor renewals, etc.

The "holy grail" of BI is **predictive analytics** (by the way, it's also where the most snake oil is sold). Predictive analytics process the data to come up with predictions of what might happen in the future. While not yet widespread in multi-family housing, there are some predictive analytics already in the common technology stack. For example, credit scoring applications predict likely bad debt and pricing and revenue management systems predict optimal rents to balance occupancy and yield. Predictive analytics value, when executed well, should be obvious—if we know something about the future, we have even more opportunity to affect that future, or at least to prepare for it as part of our decision making process.

## The BI Journey

Almost every company that ends up with a robust BI platform goes through a very predictable 3-stage evolution:

[1] In multi-family BI, we include both "near real time" (i.e. data complete as of the prior night) with true "real time" (i.e. data as of now)




In stage 1, data is almost completely silo'd. Applications are mostly standalone with their own data. Departments often have their own sets of applications with their own data. Often individual associates (particularly analysts, if there are any) have their own unique files they use (e.g. maintaining their own mapping table of reporting hierarchy). Data exchange, if it occurs at all, tends to be done by email attachments of Excel files and/or "sneaker LAN" transfers via thumb drives or similar. Visualization is typically limited to Excel graphs.

As the limitation of these data silos impedes an organization's ability to leverage its own data, companies naturally evolve into Stage 2. Analysts begin to build increasingly complex spreadsheets, often drawing from multiple data sources. At first these seem like great progress, but soon a vicious cycle develops. The increased capability of these spreadsheets drives a desire for more connected information which then leads to more complexity. Soon, these "spreadmarts" are so intertwined and complex, that even their original authors are never 100% sure exactly how they were built and how to use them.

This stage is further characterized by a sort of parallel evolution. Multiple departments create their own spreadmarts with occasional, but not very well coordinated overlaps. The natural and logical consequence of this is a proliferation of metrics and reports that never quite match each other. Even something as simple as "occupancy" ends up slightly different depending on which report you look at thus substantially eroding executive and field confidence in any of the numbers. Improved automation helps, but analysts still end up spending more time collecting and collating data than analyzing it. As they continually chase various data anomalies, they often feel like they're stuck in a corporate version of the "whack a mole" arcade game.

When the complexities, conflicts and frustrations of this stage become large enough, companies are finally motivated to invest enough to "cross the BI chasm" and arrive in the final stage of coherent BI. This is characterized by a strategic approach to understanding key business drivers, developing appropriate (enterprise) data models, and deploying applications in a well-conceived BI portfolio. This

"single source of truth" drives confidence as all users build off common definitions for metrics and a common data platform.

The BI portfolio constructed spans the range of all four dimensions of BI discussed earlier and appropriate dashboarding, visualization and alerting makes data easier for users to consume and quickly act upon. Finally, analysts spend more time analyzing data and delivering value than anything else.

**"Driving the BI bus"**

Many (in our experience most) BI projects are led by IT. The IT team identifies all the data needed to deliver a BI platform, usually by creating a census of existing reports, and proceeds to build a data warehouse to store all the data. They then build reports, making sure that all existing reports are re-created, and proceed to develop an internal portal to deliver all these reports.

This may seem natural since BI is so technology-driven; however, our experience is that allowing BI to be driven predominantly by IT results limited success at best, and abject failure at worst. These IT-driven BI projects tend to share a number of dysfunctional results:

- BI feels more like a "black box" to operators than a transparent set of key metrics. Because the goal was largely to replicate existing reports (perhaps with some sense of culling less used reports to make it easier to review the range of reports), the business side wasn't particularly engaged in the process. They were consulted on what "data" to collect (more on a better way to approach it later) and on reviewing some specific reports, but they weren't really emotionally engaged in the process and didn't learn much along the way. IT "knows how to build a data warehouse," so they do that without any real business involvement. The new BI platform is simply announced with great fanfare (and training).
- Because of the lack of deep business involvement/leadership, IT constantly has to push the business side to use the BI portal
- While valuing IT's effort, the business side typically laments that the BI platform "just doesn't quite fit"
    - It doesn't quite fit the workflow for operations, so they chafe at the perceived interruption to their daily/weekly/monthly/quarterly workflow involved in using the portal
    - They often say that they appreciate the data in the warehouse and reports, but it doesn't include everything they need…so it feels like "just another (albeit more sophisticated) place we have to go for data"
    - They find it hard to see the connection from the data and reports presented to the actions they should take. This is particularly true when the BI platform delivers mostly P&L-oriented metrics
    - Once built, they are subject to (and slowed by) IT's development cycles

A natural result is that IT becomes frustrated. Specifically:

- As the flip side of having to continually push the business side to use the BI platform, IT gets frustrated that it's not used as much as it should be

- In response to the business' complaints that the system doesn't really give them exactly what they need, IT responds (sometimes in exasperation) that "we can do anything they want…if only they would tell us." While true, the problems with this is that every design analyst knows that users and "subject matter experts" rarely are able to articulate exactly what they need unless there's a highly iterative process that lets them experiment with different solutions
- This leads to IT complaining that the business keeps changing its mind, so they keep chasing the solution. While a fair complaint, it's also a natural and logical consequence of relying on a bottoms-up approach to defining requirements rather than a top-down methodology to define the key drivers of business success and discover the metrics that best fit those. Chasing the solution is merely a symptom; it's the failure to bring the business associates through a journey to discover what really drives their business and thus what the true key metrics are that is the true root cause of the problem. More on how to do this later.

In contrast, when the business leads the BI project and IT is a partner to enable the desired capabilities, the whole experience looks and feels very different (and has a much higher success rate):

- This methodology has a naturally collaborative feel to itself. Instead of IT independently assessing needs and drawing up requirements, there's an interdependent approach. Given that the business isn't expert on the technology, it almost forces an agile approach—i.e. everything is done in small, iterative chunks. This allows the business to learn as it goes, and it avoids scenarios where IT puts in months of work only to be told they've missed the mark a bit.
- Metrics come from a top-down assessment of business drivers. We are big fans of David Parmenter's approach to doing this. There's a whole book describing it[2], but a brief overview of the process follows:
    - A cross-functional team brainstorms a list of success factors usually with the assistance of an experienced facilitator. These are reviewed by the group and combined where duplicative.
    - These success factors (SFs) are then prioritized to no more than 6-8 "critical success factors" (CSFs).
    - Next the CSFs are broken down into the various "aspects" that make up the CSF. For example, a CSF stated as "Maximize rental revenue growth" could be broken up into aspects of occupancy, new rent growth, renewal rent growth, minimizing turn time, etc. The same process is done on SFs as well—they're just lower priority
    - Following this, metrics are chosen for each aspect. Care is given to ensure an appropriate mix of results indicators and performance indicators (for a brief discussion on the difference between these, see appendix A: Results vs Performance Indicators)
    - Finally, the group separate "Key Performance Indicators" and "Key Results Indicators" from the entire set of performance and results indicators. These will be the "stars" of dashboards, reports and other visualizations.
    - This is the point where it is appropriate for IT to begin data modeling in order to collect and store the necessary data at the appropriate granularity. This allows IT to create the

[2] Parmenter, David. (2015) *Key Performance Indicators: Developing, Implementing and Using Winning KPIs.* Third edition. Hoboken, New Jersey: John Wiley & Sons, Inc.

various metrics they know the business will need and collaborate on various methods and modalities to use and present the data. We highly recommend using the Kimball methodology for data modeling, the specifics of which are beyond the scope of this white paper.

- With this approach the BI platform is typically dashboard driven instead of report driven
- By putting CSFs and KPIs front and center, the natural result is a focus on actionability. The bottoms-up approach tends to focus on results indicators while this top-down approach is much more effective at identifying performance indicators. As you can see by reviewing the appendix, the latter are naturally more action oriented.
- Lastly, this approach has a much stronger tendency to democratize the data by creating a cross functional coalition of BI champions. In fact, we recommend building on that collaborative approach be creating a "BI Center of Excellence." This isn't a new organization with new head count and new bureaucracy. Rather, it's a loose coalition of BI stakeholders across the business units who are key expert users and IT BI support experts who work together to share best practices, define new metrics (PIs/RIs) as they're needed and generally support the use and advancement of the BI platform.

This approach has a completely different look and feel:

- Because the business team was involved from the start, and the Agile approach allowed them to learn and experience things in small steps, they have a much better understanding of, and appreciation for, the BI process
- Since the BI interface was designed by the business users, they not only adopt it more quickly, but they also now constantly pull for more functionality. They see how the BI tools help them in one area and proactively request more metrics and more functionality in other areas; and since these are areas in which they feel pain, they adopt the next version of tools quickly thus creating a virtuous cycle
- BI ends up integrated with the business culture
    - Designed collaboratively with them, it fits into their workflow
    - Through using the Parmenter approach, it is by definition aligned with their critical success factors
    - By highlighting key performance indicators, it drives action
    - With the democratization of the data, analysts in different corners of the company continually use the platform for their own *ad hoc* analyses. Those that prove most valuable then become "proof of concept" tools that later can be made into "full production" functionality by IT—with the benefit that the business has already vetted the content and presentation
- IT gets the credit it is due. The business relies on the platform, so IT's role in this methodology is appreciated rather than resisted

## So Why Are So Many Projects IT Led?

With all the advantages of business leadership for IT projects, this is an obvious question. Most companies are led by smart executives who want to do the right thing, so why do so many choose an approach almost doomed to disappoint. We see several dynamics at play:

- The primary issue is a fundamental culture gap between IT and the business
    - The first, and perhaps biggest, challenge is that few business people really understand can "speak IT." We've worked with many clients who have great operators and finance people, but few (often no one) outside of IT who can talk technology (see the discussion about "purple people" under Recommendations later on)
    - Given the above, IT has experienced frustration in the past on large projects. This frustration has built into an unstated lack of trust in the business side. Don't get this point wrong—it's not that IT doesn't respect what the business people do; it's just that they don't trust the business team to lead a project as complex and technology-oriented as BI
    - IT (particularly the CIO) honestly believes they know the business. We've run into many CIOs that believe this. The reality is that, no matter how much they think they know, they simply can't fully understand what the business process really is if they don't engage the folks doing the business on a daily basis
    - In defense of CIOs, the world is littered with projects that got out of control due to scope creep; and it's generally the business side that causes scope creep. When that happens, it's rarely the business side that takes the blame—it's IT; and CIOs can lose their jobs if the failure is big and on a large program like BI. So we shouldn't be surprised that CIOs exercise a certain degree of protection in not letting things get out of hand.
- Another issue is that software salespeople generally peddle software solutions. They get rewarded for making sales and making them now. So issues like project governance and change management, particularly if they introduce a 2-4 month pre-project in place of the software implementation, are almost never discussed. Salespeople push the capabilities of their software, and C-suite executives make the mistake of thinking said functionality will solve their problems. However business intelligence is first and foremost a **business problem** to solve, not a technology problem. Sure, it's technology-enabled—that's a necessary, but not sufficient, criteria for success. You'll rarely hear that coming from any of the main software vendors in this space.
- Perniciously, the fact that so many people implement BI with a bottoms-up methodology led by the IT team becomes a reason in itself that it gets done this way. Since "everyone does it," few are speaking up for the more successful approach—a top-down analysis of need led by the business.

## Recommendations

In closing, we make three key recommendations:

1. First and foremost, companies need to hire for analytic success. If you think metaphorically of business associates as "blue" people and IT folks as "red" people, then what is clearly needed is more "purple" people—i.e. people who can span the boundary between the two. These people are out there, but there not always easy to find. Their current companies value them, so they aren't often looking for new jobs.
    a. At a minimum, bring in facilitators/consultants to fill the short-term need for "purple" people. People with experience in the Parmenter and Kimball methodologies can help the business learn how to be more articulate about their needs while simultaneously understanding and reducing the risks in execution for the IT team. They can sometimes force the provocative and constructive conversations that are hard to initiate without a third-party facilitator.
    b. Long term, search within your company for people who can span the boundary and make a conscious effort to recruit people with talents and skills in both areas
2. Use the well-established approaches (e.g. Parmenter, Kimball, etc.) to help the business state their needs and learn more how to "speak IT." Implement an Agile-style approach that emphasizes short, small and accretive iterative steps to get to the final state rather than a long and large "requirements determined up front" swing for the fences.
3. Once the business needs are determined, then trust IT to make the technology decisions. With the right goal now in mind, they can analyze the vast array of BI offerings out there and use their assessment and negotiation skills to choose the best suite of products for the best terms.

## About The Authors

**Donald Davidoff** has been a senior executive in the multi-family housing industry working in both market rate housing and senior independent living. Perhaps best known for leading the development and implementation of the Lease Rent Options™ (LRO) pricing software, his real mission for the past 20+ years has been to bring data analysis and data-driven decision making to all aspects of multi-family housing operations. He has direct experience in sales, marketing, customer engagement and associate workflow. He has served as an officer in the United States Air Force. Donald earned an MS in Systems Management from the University of Southern California and an SB is Aeronautical & Astronautical Engineering from the Massachusetts Institute of Technology.

**Chris Brust** has been providing Business Intelligence solutions to the rental housing industry for more than 20 years. Chris enjoyed a 15-year career at Archstone holding various roles in operations, pricing and revenue management (PRM), and business intelligence (BI) culminating in the role Vice President of Business Intelligence where he led the BI, analytics, market research and revenue management departments.

Since 2012, Chris has provided bespoke BI solutions to major companies in both multifamily housing and single family rentals. Prior to joining Archstone, Chris served as an Army officer in the Corps of Engineers. Chris earned an MBA from the University of Colorado and a BS in Civil Engineering from the University of Michigan.

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# Appendix: Results vs Performance Indicators

The term "KPI" (or "key performance indicator") gets thrown around almost as often (and as mistakenly) as "best practices." KPI has become shorthand for any kind of metric.

The reality is that the vast majority of alleged "KPIs" are actually results indicators, not performance indicators—and many of them are merely indicators, not key indicators. Executives and implementers who want to maximize their success would do well to learn the differences between these.

**Results Indicators** tell you how you have done, while **Performance Indicators** tell you what to do. **Key Results Indicators** measure results on **Critical Success Factors** while **Results Indicators** measure results on **Success Factors**. Similarly **Key Performance Indicators** tell you what to do on **Critical Success Factors** while **Performance Indicators** tell you what to do on **Success Factors**.

Many KRIs are mistaken for KPIs. Things like NOI, customer satisfaction and employee satisfaction have all been labeled as KPIs when they are really KRIs. That's because they are the result of many actions and don't really tell you how to improve the results. As Parmenter notes, KRIs typically cover longer periods of time than KPIs. They're important because they are essentially the report card on CSFs; however, substantial analysis and/or speculation is required to decide what to do if you are not satisfied with those results (or to know what to keep doing more of if you are satisfied with the results).

So what are KPIs? They're measures that are most important to the future success of the organization. Parmenter highlights seven characteristics of KPIs:

1. They are not financial numbers
2. They can be measured frequently
3. They are appropriate for senior executives (including the CEO) to see and inquire about
4. They clearly indicate what needs to be done
5. They tie to a specific team or individual who can act upon them
6. They have a significant impact on one or more CSFs
7. They encourage appropriate action

To illustrate, here are just a few examples of possible KRIs vs related KPIs. Not how the KRIs describe things that have already happened and are the result of many different inputs making it difficult to know exactly what to do to improve whereas the KPIs contribute directly to whether the KRI will be the same, better or worse in the future and generally make it easy to pinpoint action to take.

| Key Result Indicator | Key Performance Indicator | Discussion |
|---|---|---|
| Rental revenue growth | Pricing call attendance over last 30 days | Call attendance leads to better results and we know exactly what to do if it's low |
| Customer Satisfaction with Maintenance | % of service requests responded to within 24 hours | Quick response will likely drive satisfaction and we can focus on specific misses |
| Bad debt as a % of billed revenue | % of rent collected by the last day of the month in which it is due | Bad debt includes write-off and collections; rent collected by month end reduces bad debt and we know who to call (late payers) |