DISTINGUISHING CHARACTERISTICS OF REVENUE MANAGEMENT IN THE SELF-STORAGE INDUSTRY

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Distinguishing Characteristics of Revenue Management in the Self-Storage Industry

This brief paper reviews how seven characteristics of the self-storage industry affect designing and implementing revenue management systems in that industry. The characteristics we focus on are:

1. Low transaction volume
2. Length of rent is not controlled by the rental agreement
3. Rates can be changed during the term of the rental
4. Individual contracts and transactions can be reviewed
5. Conventional revenue management purchase fences may not be applicable
6. Computational requirements are reduced
7. Revenue management strategies and tactics are in their infancy

Low transaction volume. Compared to businesses where revenue management has generally been applied, the storage industry does not offer a good demand forecasting environment. The markets for each store are relatively small and often have distinctive local characteristics. Our analyses of the volume of transactions at individual stores has shown that the transaction volume is generally much lower than what has proved suitable and desirable for standard forecasting purposes for revenue management. Even the most popular unit sizes at the larger stores have fewer than 20 new lease starts per month.

To be sure, there are techniques that can increase forecast accuracy. Outliers can be identified; some degree of aggregation is possible; and in addition, it may be possible to supplement demand forecasts based on transaction/leasing data with other data (e.g., inquiry volume, conversion rates, competitor pricing). Nevertheless, there is a strong likelihood that compared to other revenue management venues, forecasting performance will often be substandard. Much of the problem is inherent in the nature of small samples, a mathematical fact that no amount of good design can wholly escape, and errors can be as large as or larger than the forecasted values themselves. This low transaction volume can have an impact on the demand forecasts for move-outs (supply) and for price elasticity.

The airline experience with Origin & Destination (O&D) systems, which faces similarly small numbers and finds it difficult to attain sufficient accuracy, is instructive. Extraordinarily high levels of effort and time are spent on customizing and fine-tuning forecasting algorithms for an airline. Similarly, we can see the effect of low volume in the car rental industry, where demand forecasts for specialty cars have proved unreliable. In the car rental industry, however, the low volume problem is confined to a comparatively small percentage of the business; the system may simply be turned off for some locations or car classes. A more robust approach is indicated in the self-storage industry, where low transaction volume affects a much larger proportion of the business.

Consequently, relative to other industries where revenue management has proven effective, the self-storage industry has more to gain from techniques that measure the confidence forecasts deserve and make recommendations accordingly. Pricing and inventory actions would be

conservative when confidence is low and aggressive when confidence is high. This approach limits the risks created by weak forecasts while taking advantage of the full potential of stronger ones.

In addition, the low transaction volume combined with the variability of demand that we have seen in self-storage data, indicates that forecasts of *unconstrained demand* are likely to be less accurate than desired. Unconstrained demand is the total demand that a self-storage location would serve if it had unlimited capacity at a store. During peak periods, such forecasts commonly provide the basis for pricing recommendations in revenue management systems.

Length of rent is not controlled by the rental agreement. Unlike hotels, apartments, and rental cars, leases have no set term. Except for a small percentage of customers who prepay, virtually all customers have monthly/at-will agreements. This creates both a problem, in that effective length-of-rent controls are difficult to apply given current practices, and an opportunity, since rates can be changed more easily on existing business.

The principles of optimizing length of rent (LOR) have been well developed in hotel applications, which have demonstrated their revenue enhancing potential. The issue for the self-storage industry is what form practical length-of-rent controls should take given its products, market, and administrative/system capabilities. Carefully controlled experimentation is apt to be required here, and the revenue management system should provide support for both operating and evaluating these efforts, to insure that risks are minimized and information is maximized.

Rates can be changed during the term of the rental. Unlike other industries using revenue management systems, rates can be changed periodically after a product is sold. The information we have collected from interviews with self-storage executives, in combination with data analyses we have carried out suggest that in many situations the current approach used by self-storage firms results in rate increases that are overly cautious. While we recognize that this tendency may not hold for all self-storage firms, we suspect that it is more likely to be the case than not.

Particularly because rates can be changed during the term of the rental, but also because demand estimates will often be unreliable, self-storage industry revenue management may have more to gain from a rigorous empirical approach to measuring elasticity than is typically the case. Typically, revenue management systems make broad assumptions about elasticity and then largely treat it as given, forecast demand, and make decisions accordingly. Many revenue management systems use a single elasticity parameter value for all locations – in part, companies have found this to be a necessary simplification because the system provides little or no support to estimate and track the accuracy of elasticity estimates.

More accurate and properly segmented information on elasticity should enable more advantageous rate revisions, and guide the setting of start rates. It is worth noting that even in periods of low demand, price increases are still possible for market segments with low elasticities. The challenge is identifying those segments.

Also, elasticity may be a more stable dimension than demand. If this is the case, to the extent decisions can be guided by elasticity, dependence on day-to-day demand forecast accuracy would be reduced.

The combination of the ability to change rates during the term of the rental, and difficulties with predicting demand, produce unusually high incentives to pursue empirically measured and carefully segmented elasticities.

Contracts can be reviewed individually. Revenue management has typically focused on making the right pricing decision for market segments, not for individual transactions. In industries with high transaction volumes, this has proven very effective. But it may not be as effective, or necessary, in the self-storage industry. While the low transaction rate undermines one cornerstone of conventional revenue management practice, it enables an alternative and more interactive approach that is also consistent with the operating practices we have seen at self-storage companies. Typically, within large self-storage firms, there are staff that track occupancy and availability at a very hands-on level. They respond with pricing actions to changes in availability. They may even give individual attention to each lease when considering pricing actions. (Imagine having staff at an airline, hotel, or car rental firm with responsibility for reviewing and potentially adjusting the prices offered to every prospective customer).

By pulling together basic pieces of information on a lease and store performance, self-storage staff act selectively on each piece of business. What they frequently lack, however, are structured decision support tools that could enable them to make better decisions. For example, it is not easy for these staff to evaluate how similar pieces of business have responded to a price increase in the past; nor do they have quantitative tools to conduct sensitivity analyses (e.g., "what if" planning tools) to better understand the potential profitability and risks of alternative price increases. Revenue management models and decision support tools that drill down to the individual transaction level appear feasible, desirable, and operationally consistent with current industry practices.

Conventional revenue management purchase fences may not be applicable. A central feature of revenue management policies is avoiding dilution by designing lower priced products that do not appeal to customers who are willing and able to pay more. Conventional fences, however, such as those constructed by advance purchase restrictions, weekend stay-over, and varying rates by length of lease, are typically not in use. Although there are applications of price differentiation based on length of rent, even these are fairly minimal. While there are opportunities to construct fences based upon such factors as payment terms, length of rent and usage conditions, questions of their acceptability to customers and the practicality of their implementation remain. Also, the effectiveness of fences will in part depend on how competitors react, whether they adopt similar policies or attempt to compete by avoiding purchase restrictions.

This is not to say that consideration should not be given to what types of purchase fences can be designed that would allow a self-storage firm to offer a wider set of products targeted to different market segments, based on willingness to pay. In fact, we recommend just the opposite. A national or even a regionally important self-storage firm that goes down this path may well have

an opportunity to be a market leader and change some of the fundamentals of how self storage operates. Our primary point is that although self-storage products based on purchase fences are not currently in place, a self-storage revenue management system should be designed to allow for this possibility and opportunities to design and implement purchase fences should be given close attention as self-storage firms develop their revenue management programs.

Computational requirements are reduced. Broadly speaking, the data processing requirements of a self-storage revenue management system are less than those of other industries where revenue management has proven successful. The low transaction rate combined with a relatively less complex pricing structure, reduce the amount of data that need to be maintained and processed on a daily basis. Fewer modeling compromises will need to be made. System development risk is reduced.

Finding the optimal price requires the mathematical balancing of revenue gained or lost by price changes against revenue gained or lost by changes in occupancy. But these computational demands are not high on a store-by-store basis. With less pressure to process high volumes of data within a limited time frame, opportunities may exist in areas that do not typically receive as strong a focus. For example, stronger than usual exception reporting capabilities could prove beneficial, such as providing e-mail alerts to staff who access the network from remote locations.

There is an additional consideration. Most of the benefits of revenue management can be produced by creative applications that require relatively low technology methods. This includes providing credible and actionable information in a timely manner, focusing staff attention on opportunities for taking pricing actions, and enabling staff to better understand the likely financial impacts of alternative pricing actions.

Revenue management strategies and tactics are in their infancy. As well thought out as an implementation of revenue management in a new industry may be, and as effective at raising revenue from early on, it will not be the equal of what it can be after a few years of experience. As staff gain experience with the tools and become accustomed to thinking in revenue management terms, they are likely to find industry specific solutions and opportunities that were not apparent at the outset—solutions that require industry specific expertise.

The design of the system, and the way it is implemented, are apt to play a large role in how well this maturation process goes. The system can support the level of intelligent participation required—by the information, guidance, and feedback it provides; by the what-if explorations it allows and suggests; and in general by its flexibility, accessibility, reliability, and transparency. If the system is weak in these areas, it can get in the way. The system design process should pursue outstanding questions such as the best mechanisms to control length of rent, the quality of demand forecasting and the actions that are most appropriate to different levels of confidence in those forecasts, whether customer type can be used to segment the market in terms of elasticities, and so on, closing in on answers as it goes along. These are not questions that industries with more mature revenue management development typically have to contend with, at least not on the same level.

The requirements of the maturation process lead to a more collaborative relationship between revenue management vendor and client than is perhaps typical for the installation of business technology, as they are dependent on each other's expertise for finding the best solutions.

