

DO VIRTUAL DATA ROOMS ADD VALUE TO THE MERGERS AND ACQUISITIONS PROCESS?

by

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EXECUTIVE SUMMARY

Three significant trends have emerged in today's corporate environment. First, advancements in technology play a major role in redefining how companies do business, from allowing employees to telecommute to the proliferation of e-procurement activities. Second, although mergers & acquisitions (M&A) activity is not new to the corporate environment, recent years have seen a dramatic increase in deals, with global M&A transaction volume increasing on average by 37% per year between 2003 and 2006. M&A are key tools for corporate executives in achieving their short- and long-term strategic objectives. Third, with the increasing trend towards globalization, cross-border M&A activity has also increased and cross-border transactions accounted for 28% of all transactions during 2006, up from 18% in 1996.

Given these trends, M&A transactions — whether acquisitions, auction processes, or mergers — are using technology to increase the efficiency and success rate of deals. The virtual data room (VDR) has emerged as a technology-based due diligence tool whose objective is to facilitate access and use of the data room in M&A transactions. Our study examines the role of the VDR in due diligence and attempts to ascertain its contribution to the overall M&A transaction process.

For all transactions, the objective of due diligence is to assist a buyer in determining whether to acquire a target, if so, for how much, and to allow the buyer to ascertain the target's risks, potential combination benefits, and overall strategic fit. To help a buyer answer these questions, information related to a target company are made available in a data room during the due diligence stage of a transaction. Thus, the data room is an integral part of the due diligence process.

Almost 20% of all executives involved in an M&A deal consider due diligence to be crucial to the success of a deal. Other factors contributing to the success of a transaction cannot be standardized or systematically improved using technology or other methods. After recognizing the importance of due diligence in realizing higher values in M&A transactions, M&A professionals have begun to introduce modifications to the data room that take advantage of today's technological advancements. These modifications, gradually developed over time, have ultimately resulted in the introduction of what is known today as the virtual data room (VDR).

VDRs reflect the trend towards digitalizing almost anything that exists in physical form. A VDR is similar in many ways to its predecessor, the physical data room (PDR). Both allow the buyer to conduct an organized assessment of the target. Several differences between a VDR and PDR exist, such as their location (online versus physical location), document format (digital versus paper), data storage (central storage versus physical location), and form of access by several potential buyers (parallel versus sequential). Therefore, documents in a VDR are presented more efficiently and effectively in digital format. Moreover, access to a PDR is typically sequential, while access to a VDR is exclusively parallel. In a single PDR, only one buyer team may access the information and multiple physical data rooms must be set up at added effort and expense if a process is to be accelerated with several potential buyers participating. Through a VDR, multiple buyer teams may access the same data at the same time.

The features of a VDR vary among VDR providers, but most offer a few key functions. VDRs provide text recognition functionality and enable users to search for

specific words and phrases throughout the entire data collection. Many VDRs allow buyers to securely ask questions online through a Q&A function, enhancing communication between the parties. The audit trail function of a VDR allows for tracking of documents accessed by specific users, and allows sellers to monitor and profile buyers to determine the most serious participants. Dynamic indexing allows more flexible and immediate updates to the data room index compared with paper indexing. VDRs also come with security features, such as allowing the administrator to restrict viewing of certain documents to only the second round of due diligence, or to restrict printing and downloading of certain documents.

A target’s primary objective is a successful sale at the highest possible price. The acquirer’s objective is to determine whether to purchase the target, and at what price. With these conflicting objectives, VDR-related advantages to a buyer may be disadvantages to a seller, and vice versa. Table 1 summarizes these advantages and disadvantages, which are discussed in detail in this report.

Table 1. VDR Advantages and Disadvantages to Buyer and Seller

	To Buyer	To Seller
VDR Advantages	<ul style="list-style-type: none"> Cost savings Time savings Comfort Transparency Fair playing field 	<ul style="list-style-type: none"> Simplicity Ease of Setup Cost savings Competitive price Legal compliance Time savings Security
VDR Disadvantages	<ul style="list-style-type: none"> Competitive price Reading documents online System speed Non-digital information 	<ul style="list-style-type: none"> Security

Although a VDR benefits its users in many ways, our conclusion today is that we cannot categorically confirm that VDR usage increases the overall efficacy of the M&A process. We have determined that certain VDR-related process changes may add value to the M&A process, including the transition from sequential to parallel inspection, improvements in process quality, reduction in the duration of a transaction, and theoretical benefits such as greater information utility to a buyer, potentially definition of optimal price, and lower increases in marginal costs.

We have also determined that a VDR demonstrates concrete advantages over a PDR for specific types of transactions: larger transactions, auction-type processes with many potential buyers, international and cross-border transactions, and transactions with limited due diligence period. These types of deals benefit the most from the use of VDRs’ ability to allow parallel access to the data room by multiple buyers, and in reducing travel-related expenses by offering continuous and ubiquitous access to a buyer regardless of location.

In summary, the practical and theoretical benefits to using a VDR are convincing. The prevalence of “old timers” and their involvement in M&A transactions will continue to result in a growing acceptance of the VDR as a standard tool for due diligence in M&A transactions. As technological advances continue to change the way we live and work, we expect that VDRs will become the accepted and most widely used data room tool for M&A transactions.

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1 INTRODUCTION

In today's corporate environment, where minor modifications to cost structure, slight improvements in resource utilization, modest reductions in supply chain processes and similar enhancements to the overall operation of a business translate into significant improvements in profitability—and where efficiency is a critical success factor—the appearance of the electronic or virtual data room (VDR) in due diligence processes should be no surprise. VDRs are almost expected in today's environment, as their purpose is to enhance the efficiency and effectiveness of the due diligence process, thereby reducing associated costs and simplifying procedural aspects for participants in mergers and acquisitions (M&A) transactions.

Technology has enhanced many business processes and activities, and new and creative uses of technology are expected to have similar positive effects on existing businesses. In recent years, we have witnessed technology's effect on the M&A process through the introduction of the VDR. The extent to which the application of a VDR has changed the execution of M&A deals and a VDR's value-add to the M&A process are the main issues explored in this study. To assess these major issues, determining answers to the following questions guides us through our research:

- Do VDRs make overall due diligence more efficient and effective by accelerating the process, by reducing related costs, and therefore the entire process for participants in M&A transactions?
- How does the due diligence process change when using a VDR?
- What is the effect of the use of technology on the due diligence process?
- Are cost reductions experienced when using a VDR, and if so, for whom?
- By using a VDR, do users experience improvements in the due diligence outcome and the outcome of a transaction?

These and other similar questions were the seeds from which the idea for this study emerged. This report, therefore, is an unbiased evaluation of VDRs and determines whether or not utilizing a VDR makes a difference in the due diligence process, or whether a VDR is simply a cosmetic change and a trendy approach to due diligence in the modern M&A process, fueled by the ever-increasing number of VDR providers.

The evaluation method used consists of interviews with four main parties: sell side companies, buy side companies, M&A professionals, and VDR providers. We emphasize that the data and information they provide, along with their impressions, opinions and judgments, provides the raw material and a basis from which to draw conclusions throughout this study. That a fairly large number of people from all groups were involved in the research provided a wide spectrum of viewpoints on both VDRs and the due diligence process itself, which should ensure an objective evaluation of the aspects of VDRs that are the topics of interest in this report.

Trends in Mergers and Acquisitions

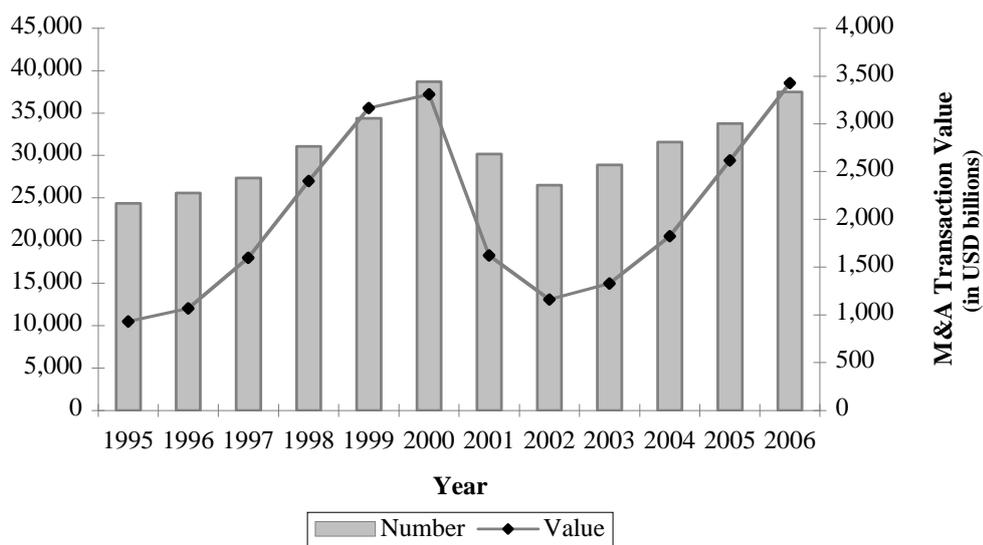
Globalization and the merging and convergence of a larger number of small units into a smaller number of large units is a psychological trend that has characterized our way of thinking since the beginning of the 21st century. Moreover,

the business environment—the main driver of globalization—was not and could not have been spared this trend. Consequently, on a global basis, we are witnessing an ever-increasing number of M&A deals each year. This trend is not surprising, since mergers and acquisitions are the optimal tools used by companies to achieve growth that is a key strategic objective of almost every business today.

Acquiring and merging do not occur simply to increase size, or to grow. The key reasons for M&A activity are to reduce overcapacity, expand geographically, extend products and/or markets, attain R&D capabilities, and converge industries.¹ These are all perfectly valid reasons to engage in, and they provide justification for, M&A; nevertheless, behind it all, enhancing shareholder value is the underlying driver of these deals.

This rationale has caused an increase in both the number of and value of M&A transactions. Despite a global economic slowdown during the first few years of this century, the number of M&A transactions and their value both continue to increase. Figure 1 shows this trend by graphing the number of global deals executed along with their aggregate values, from 1995 to 2006.

Figure 1. Number of and Value of M&A Transactions Worldwide, 1995 to 2006

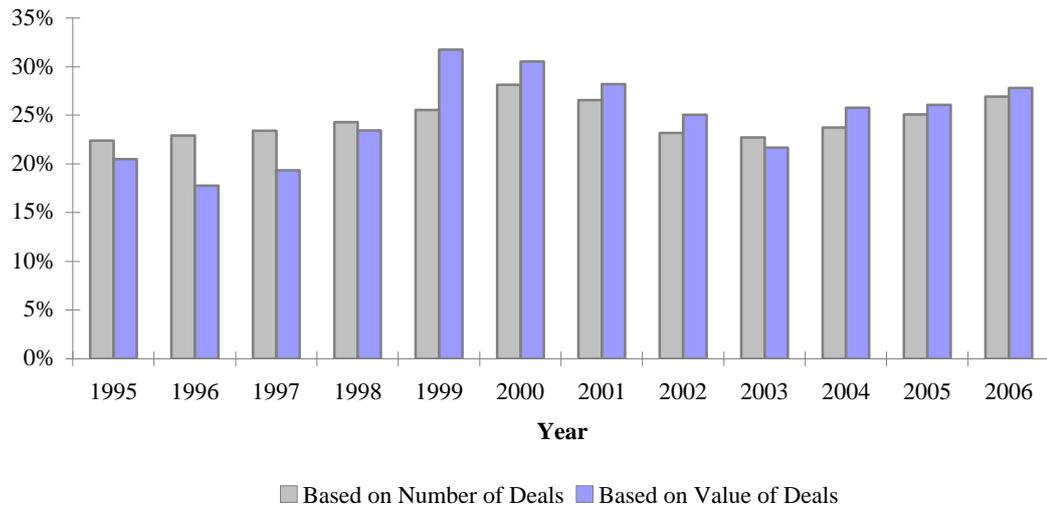


Source: Thomson Financial

In addition to the increase in the number and value of deals globally, which is expected to continue into the future, we have also seen a significant increase in cross-border M&A activity. With advancements in globalization, the increase in cross-border deals is no surprise, as such transactions are the best indicators of globalization. Figure 2 depicts the growing number of and value of cross-border transactions. Interestingly, the data emphasize the importance of internationalization as an impetus for M&A transactions, as almost every third M&A deal is a cross-border transaction—and we expect this percentage to increase in the future.

¹ Bower, Joseph L. (2001): Not All M&As Are Alike—and That Matters, in: *Harvard Business Review*, No. 3, Vol. 79, pp. 92–101.

**Figure 2. Cross-border M&A Deals as a Percent of Total Worldwide M&A Deals
(by Number and Value) 1995 to 2006**



Source: Thomson Financial

Having identified the increase in the cross-border nature of M&A transactions on a worldwide basis in the past few years, and with consideration for the relatively low success rate of M&A deals in general, professionals have begun to pay closer attention to the execution of transactions. By noting the increase in both the number and value of M&A deals, and by questioning whether the increasing percentage of international M&A deals merits a change in the manner in which they are executed, M&A professionals have slowly and steadily begun to make a shift in the application of technology in transactions. Using the Internet—the foundation for all other technological improvements in the business environment—as a platform, the emergence of the VDR may significantly change the way M&A transactions are executed. However, before examining whether this “could” actually “is” and before examining the aspects of a deal that may be modified by using a VDR, we must first define the M&A transaction process and the areas in which the use of technology such as a VDR may be applied.

The M&A Process

Earlier, we noted the strategic motivations that may cause a buyer to engage in an M&A transaction. We must also understand the expectations of both buyers and sellers once they have engaged in the process. A seller’s main priority is to sell a company, subsidiary or a part of a company, for the highest consideration possible. A seller’s second priority is to sell to the buyer who is most likely to continue operating the company effectively, making appropriate investments in the business and retaining existing human resources. On the other hand, an acquirer’s main priority, aside from strategic rationale, is to purchase an entity at a price that it perceives to be fair. A “fair” price, as perceived by an acquirer, is the price that accurately reflects the value of the entity being purchased and enables the acquirer to make profit in the long run for a strategic investment, or in the short run for a financial investment. Therefore, an acquirer is interested in reducing the information asymmetry that exists between buyer and seller, and in increasing the transparency of the entire process.

Today, mergers between two or more companies are almost commonplace. Although strategic reasons for such combinations are numerous, the overriding reason

for such activity is to create shareholder value for the owners of the combining entities as, ideally, two companies are more effective together than when standalone.

Companies engage in acquisitions because they seek growth, and acquisitions allow companies to grow faster than through internal growth efforts. Although not significant, a distinction exists between the fundamental philosophies of a merger versus an acquisition.

An acquisition, although typically regarded as identical to a merger, differs in that the company being acquired (the “target”) may either (a) cease to exist, where the target’s assets are integrated into the acquiring company, called an asset purchase (or liquidation); or (b) continue operating as an independent, standalone entity, called a share purchase. With a merger, both companies in effect cease to exist, and a third entity is formed from the combination of the two entities.

Although mergers and acquisitions are not identical, the transaction process consists of the same basic stages, chronologically executed in more or less the same order. This process may be divided into five key main stages. Both types of transactions begin with the preparation stage, followed by the pre-due diligence stage, the due diligence stage and the negotiation stage. The entire process ends with the completion of the transaction during the closing stage. A thorough understanding of the M&A process is essential to understanding the context in which data rooms occur. We will briefly examine each stage chronologically with respect to the activities of both the buyer and the seller. Figure 3 provides an overview of the process and Table 2 provides a brief overview of the steps within each stage of the process for both the buyer and the seller.

Figure 3. M&A Process Stages and Deliverables

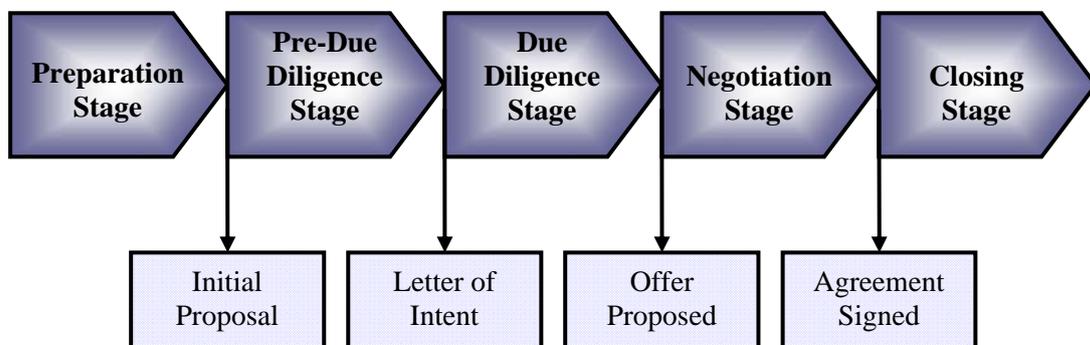


Table 2. Overview of M&A Process from the Perspective of Buyer and Seller

Stage	Buyer Seeks Merger or Acquisition	Seller Seeks Sale of Company/Assets
Preparation	<ul style="list-style-type: none"> • Draft M&A strategy • Select external advisers • Create complete list of potential targets • Research available information on targets • Select short list of targets to approach • Upon receipt of a teaser and/or approach by a potential acquisition target, determine strategic fit 	<ul style="list-style-type: none"> • Strategic review • Prepare business plan • Evaluate options and determine assets/businesses for sale • Select external advisers • Create list of potential buyers • Prepare teaser and information memorandum • Begin compiling data for due diligence and the data room • Refine management presentations
Pre-due diligence	<ul style="list-style-type: none"> • Approach target and make initial contact • Sign confidentiality agreement • Compile high level, nonpublic data • Plan detailed due diligence • Decide whether to make preliminary offer • Organize due diligence team 	<ul style="list-style-type: none"> • Contact potential buyers • Distribute information memorandum • Set up data room • Complete management presentations • Distribute draft agreements • Obtain indicative offers
Due diligence	<ul style="list-style-type: none"> • Data room inspection • Review of private documents • Assess and analyze information • Evaluate risks and potential returns and prices • Structure transaction and terms 	<ul style="list-style-type: none"> • Prioritize letters of intent • Create short list of potential buyers • Set deadline for offers • Provide assistance in data room
Negotiation	<ul style="list-style-type: none"> • Negotiations • Make final offer • Reach agreement 	<ul style="list-style-type: none"> • Compile final offers • Select best offer • Negotiate and agree on terms
Closing	<ul style="list-style-type: none"> • Release due diligence teams • Execute agreement and arrange for transfer of compensation • Begin post-merger integration 	<ul style="list-style-type: none"> • Terminate data room • Execute agreement and ownership exchange

As previously noted, conducting due diligence does not occur exclusively during the due diligence phase of an M&A transaction. Rather, due diligence is ongoing throughout the entire transaction, starting before the first contact is made and continuing up until the final offer is made. The due diligence process involving the use of data rooms, which is the subject of this report, occurs during the third stage of an M&A transaction, called the due diligence stage (as seen in the Figure 3). This due diligence stage is, to some extent, similar from transaction to transaction in terms of methodology and approach.

The remainder of this document is structured as follows. Section 2 provides a brief overview of the due diligence process and its perceived important by those involved in an M&A transaction. Section 3 discusses the aspects of the traditional physical data room (PDR). Section 4 introduces and analyzes the concept of a virtual data room (VDR). Section 5 summarizes our findings. The Appendix includes detailed information and highlights the critical documents and information provided in a data room, a list of providers of VDRs as covered in this study, and a list of sponsors.

2 UNDERSTANDING DUE DILIGENCE

A clear comprehension of due diligence and what it entails is essential for a further understanding of the topics discussed later. As Figure 3 shows, due diligence is at the heart of every M&A transaction, and without the due diligence process, no deal would ever go through to completion. Due diligence is a process whereby an acquirer does his “homework” on the target. As one can imagine, due diligence is a lengthy process and is far from being standardized. Due diligence processes vary greatly with respect to many factors, including duration and scope, and number and types of people involved, depending on the target’s industry, size, organizational structure, history, and legal status.

Although due diligence processes differ significantly among M&A transactions, each process has the same basic purpose of assisting a buyer in determining whether or not to acquire a target, and if so, how much should be paid for the target. Through the due diligence process, a buyer is able to evaluate the risks related to the transaction and how much to pay for a potential target. If the diligence process reveals that the target is too risky an acquisition for a buyer, the buyer will either decline to make an offer or offer to purchase the target at a lower price than initially willing to pay. Due diligence, therefore, is a tool to assist buyers in assessing realistic values of target companies by evaluating their strengths, weaknesses, risks, synergies and overall fit within the buyer’s strategic plan.

With this goal in mind, we can further identify the specific areas of a due diligence process that can help a buyer resolve these issues. Generally, information commonly audited in a due diligence includes corporate documents (strategy, background, organizational structure, certificates of incorporation, management and board biographies, subsidiary information, business unit information, etc.); audited financial information and unaudited budget information, material corporate agreements (terms, liabilities, obligations, consequences of material breaches, termination conditions, change of control provisions, etc.); documents related to governmental regulations; legal review; other material information; environmental review; and other industry-specific and business-specific areas.²

A well performed due diligence is one of the most crucial factors for the success of an M&A transaction. Almost 20% of all executives involved in an M&A process consider this to be crucial for the success of a deal.³ The other factors mentioned that contribute to the success of a transaction—culture and the ability to adapt to change and management and leadership—cannot be standardized or systematically improved using technology or other methods, and most are not part of the due diligence process. Therefore, due diligence is the only dimension in a transaction where standardization and systematic improvements are possible and contribute to higher transaction success rates. After identifying due diligence as the element that, if improved, is most likely to result in higher realized transaction values, M&A professionals have begun to introduce modifications in the main tool used in due diligence, the data room. Such modifications, gradually developed, have

² Alexandra Reed Lajoux and Charles Elson (2000): *The Art of M&A Due Diligence*, New York: McGraw-Hill, pp. 48–65.

³ Ravi Chanmugam, Walt Shill, David Mann, Kristen Ficery and Bill Pursche (2005): The intelligent clean room: ensuring value capture in mergers and acquisitions, in: *Journal of Business Strategy*, No. 3, Vol, 26, pp. 43–49.

ultimately resulted in the introduction of what is known today as the virtual data room.

Before describing VDRs, we first review the traditional data room, that we labeled physical data room.

3 PHYSICAL DATA ROOMS

A physical data room (PDR) is the most important tool in the due diligence process and serves the same function for a seller's company as does the display case for a commercial establishment—a place to display one's goods for sale. The PDR is a physical location, typically a secure room provided by the seller, where all information regarding the target is temporarily maintained for viewing by potential buyers.

In a PDR, information is made available in the form of files and documents placed in binders, folders and boxes. Investors, prospective buyers and potential bidders send their due diligence teams to a PDR to inspect in detail both publicly available and nonpublic information. A PDR is secure, as no documents are permitted to enter or leave the room unless authorized by the appropriate individuals.

3.1 Information in Data Rooms

Data rooms contain primarily documents—files, letters, records and transcripts—but may also include other relevant information in any form, from audiotapes to soil samples. The data in the PDR are resources that represent legal proof of the target company's asset value and reveal its earning potential and ultimately its value.

Before entering a data room, buyers typically have a good understanding of the target and its business, and have a preliminary opinion on the consideration they would pay for a target. In these cases, buyers inspect documents to discover hidden earnings potential that may be capitalized upon or to uncover hidden risks that are not publicly known. The buyer will therefore send its team of experts to verify their known information about the target with the contents of the data room and to gather new information.

The substance of due diligence is to act diligently and verify in detail the information presented by a seller. In a well executed due diligence process, an expert in the field should inspect each document in the PDR, regardless of whether the information is obvious. However, due diligence is never perfect given many limitations, resulting in risks and potential benefits remaining hidden regardless of the time spent analyzing the information provided.

Resources found in a data room vary among transactions; however, several standard and obligatory categories exist from both a legal and a valuation perspective. These areas cover legal, accounting, tax, information technology, risk and insurance, environmental, sales, operations, property, intellectual assets, finance, cross-border issues, human resources, and other issues.⁴ Appendix A lists some documentation and other resources that cover these areas.

⁴ Robert F. Bruner (2004): *Applied Mergers and Acquisitions*, Hoboken: John Wiley & Sons, p. 215.

3.2 Providing and Using Data Room Information

Many individuals from both the buyer and the seller are involved in the due diligence process. We concentrate on participants who are directly or indirectly involved in setting up a data room, using the data room and preparing documents found in the data room. We also make basic distinctions between the roles of buyer and seller participants and briefly touch on mutual due diligence in a merger.

When a transaction is classified as a merger, both buyer and seller perform due diligence on each other. Two data rooms are set up, one for buyer information and the other for seller information, and both teams access each other's information to determine fair and equitable consideration to be exchanged based on various financial and operational factors.

Security is a critical issue in managing the data room, as sensitive information should not be allowed to fall into the hands of people not covered by nondisclosure or confidentiality agreements executed between the parties. Such information leaks can have detrimental effects on the entire transaction process, and may adversely affect the consideration being paid by a buyer, or the consideration being exchanged in a merger, if either party senses a process damaged or tainted by leaks. A coordinator is assigned to manage the operation of the data room by minimizing security and information leaks, recording data room attendance, and searching briefcases and other bags as attendees leave the data room.

Target Company

To begin the process of setting up a data room, top management of the target company will either be directly responsible for managing the selling process or, more frequently, will form a special team responsible for execution of the transaction. This team interacts with both senior management and department managers to coordinate the compilation and gathering of documents from different operational areas of the company, set up the data room, and guide the selling process.

The process of collecting the necessary data room documents and information is extensive and time consuming. Data must be compiled, copied (original documents should not be kept in the data room), indexed and properly organized and this process takes up valuable resources. An index listing the information in the data room should be compiled and distributed to potential buyers to facilitate their due diligence preparation.

Point persons from each relevant operational area, such as marketing, finance, manufacturing and human resources, are assigned to manage the data room information from their areas. The point person ensures that their operational area provides the information needed, indexes the relevant documents and information, coordinates with management regarding documents that may be copied, and verifies that information that cannot be copied.

Buyers and their due diligence teams may request copies of certain documents to take with them to facilitate their analysis and to save time manually noting down such information or typing it into their laptops. Target company management must decide on the documents that may be copied, given security concerns. Documents that may be copied should be noted on the data room index as such.

Acquiring Company

Senior management at the acquiring company will delegate the M&A process to a special team of experts responsible for assessing the value of the target company. The composition of the buyer's team is likely different from that of the seller's team because of the buyer's motivation, depending on whether the buyer is strategic or financial.

A financial buyer seeks to buy a company and resell it later for a higher price. Therefore, its transaction team consists of experts with financial backgrounds to ensure that a fair price is paid and the proper consideration structure (consisting of a mix of cash, stock, preferred securities, and debt) is offered to facilitate high future returns. On the other hand, a strategic buyer with long-term plans to integrate the target into its business has a transaction team focused more on paying a fair price for the target and on post-transaction integration, cost savings, and synergies. In this case, experts are industry specialists examining the target at the technical and operational level rather than evaluating the target purely for its financial prospects.

After inspecting the relevant documents, each team member provides a summary of findings regarding his or her area of expertise. These summaries are then collected and incorporated into a diligence synthesis and a technical and financial analysis of the target. Expert recommendations are then summarized into an integration recommendation (mainly for strategic buyers).⁵

External Advisors

Guiding the transaction process for both the acquirer and the target involves active involvement by management and the deal teams during all stages of an M&A transaction, as outlined in Table 2. Deal teams from both sides consist of company managers experienced with M&A transactions or similar deals and advisors for different fields of expertise. Such advisors may be internally or externally recruited, or outsourced. Usually independent financial, accounting, and legal advisors are engaged, as the advice from investment banks, consulting companies, auditors and law firms bringing in significant M&A transaction experience. At an increasing rate, such external advisors are becoming familiar with the benefits of virtual data rooms and are promoters for substituting PDRs with VDRs.

4 VIRTUAL DATA ROOMS

4.1 Concept

We have witnessed that almost anything that exists in physical form may be transformed into digital or virtual form. In the past couple of decades, we have seen games, correspondence, auctions, betting and gambling and many other aspects of our everyday lives being transferred to the virtual dimension that has, in a way, become our reality. At the start of the new millennium, a similar transformation occurred with the M&A transaction due diligence process when the first VDR was set up and used, in place of a PDR. Although a tool similar to a VDR was used over a decade ago by loan syndicators for the review of large amounts of data by a large number of people in the context of large transactions, the first VDRs for an M&A deal were used sometime in the late 1990s.

⁵ Robert F. Bruner (2004): *Applied Mergers and Acquisitions*, Hoboken: John Wiley & Sons, p. 214.

The simplest way to explain a VDR is to compare it to a PDR, as both serve the same ultimate purpose. Table 3 highlights the significant relative characteristics of both VDRs and PDRs.

Table 3. Relative Characteristics of VDRs and PDRs.

Characteristic	VDR	PDR
Concept	Digital	Physical
Location	Website on the Internet or Standalone application	Physical location
Document format	Digital	Paper
Data storage	Central server	Physical room
Data access (by single buyer or multiple buyers)	In parallel, no waiting is required to access information	Sequential access, resulting in a lengthier process

In a VDR, documents are presented more efficiently and effectively in digital format, in contrast with physical documents in a PDR. The major difference between a PDR and a VDR is in the area of access. Access to a PDR is typically sequential, while access to a VDR is exclusively parallel. Using a PDR, only one buyer team may access the information in a data room (unless multiple data rooms are set up at added expense and effort) while multiple buyer teams may access the same data at the same time through a VDR.

To fully understand a VDR, we first describe its setup process. Two ways exist to set up a VDR: internally, when provided by the selling company, or externally by outsourcing the set up process to a specialized VDR provider. In each case, the VDR development process looks the same. Considering that for most transactions using VDRs, VDRs are either fully or partially outsourced, we assume that outsourcing is the standard method used to set up a VDR and we describe the VDR setup process that uses an external provider.

In the preparation and pre-due diligence stages of an M&A deal, the target compiles all necessary documents. Then, during the due diligence stage, the company contacts a VDR service provider. The six major stages of VDR setup then take place. We present the six stages in chronological order:

1. A conference call or seminar is held with the client and all VDR participants from the target are instructed on using a VDR.
2. The client's needs are assessed, including the number of pages to be uploaded to the VDR, the pages that need to be scanned, the number of buyers being invited to access the VDR, and the duration of the data room process.
3. The client and the provider sign a standardized service contract.
4. A VDR is created based on the client's needs regarding storage capacity and number of users; this is done either from scratch or by using a predefined template.
5. Pages are scanned and uploaded to the VDR and an online index is created.
6. Maintenance issues are addressed, including assessing participants' technical needs and questions, uploading "late" documents, and security checks.

Assuming that all of the documents are compiled prior to the first development step above, setting up the VDR itself takes on average from one to two weeks. Selection and preparation of the actual content and documents is by far the more cumbersome job. After the first contact between the target and the VDR provider until the time that the online index is completed and ready for use (end of stage 5) is typically about 10 days. Although a VDR may theoretically be set up in less than 72 hours, it is unlikely that all setup tasks necessary from both sides can be preformed within such a short period.

If the client did not compile all necessary documents before contacting the VDR provider—a common occurrence—one could argue that scanning and uploading may prolong the setup time, as these tasks need to be done in parallel to the setup of the VDR. However, uploading “late” documents after the VDR has been established is part of step 6, the maintenance stage. With this in mind, uploading of “late” documents should not normally affect the usual setup time, as this task occurs for the duration of the VDR and is not necessarily integral to the setup process. In addition, inserting “late” documents also happens with PDRs and is therefore irrelevant when comparing setup periods for VDRs and PDRs.

Another differentiating characteristic of a VDR is the existence of a variety of technology-based features and functions that enable due diligence to be performed more easily, quickly, effectively and efficiently.

Table 4 describes some of the most widely known attributes of a VDR. However, they are just attributes and are not essential for the existence and basic functioning of a VDR. Some features, however, such as the audit trail and dynamic indexing, are quite common and extremely beneficial to a VDR. Along with the other features, they greatly enhance the advantages of VDRs over PDRs, which lack most of these functionalities. Not every VDR provider, however, offers these features.

Table 4. Popular Features and Functions of VDRs.

Feature	Description
Text recognition	<ul style="list-style-type: none">• Offered by some VDR providers; allows text in scanned documents to be recognized by a computer program, effective for searching and spell-checking.
Search function	<ul style="list-style-type: none">• A key feature of a VDR; enables users to search documents for specific words and phrases, similar to Internet search engines.• A significant improvement over PDRs, where document searches are done using the document index and are only document-level searches that do not allow for searching of specific words and phrases.• Some providers deem the search function to be unreliable and hence do not offer it.
Q&A function	<ul style="list-style-type: none">• Allows buyers to ask sellers questions related to the data room and its contents, securely and efficiently. VDR users may ask questions through the VDR screen interface by clicking on a 'Q&A' icon; some VDRs may allow for the routing of questions directly to the appropriate operations team member.• While asking and replying to a question, both buyer and seller representatives may easily refer to the document in question by simply clicking on its icon.
Audit trail function	<ul style="list-style-type: none">• Allows for document tracking, including viewing access by frequency, date and user; enhances transparency of the data room process.• Gives the target the ability to profile and rank potential buyers based on their level of interest and indicates the most frequently accessed documents; this is important in ascertaining the buyers that should proceed to a second round of due diligence, which usually involves disclosing sensitive company documents.• Gives the potential acquirer the ability to assure that all documents have been read.• In the event of legal proceedings or misuse of confidential documents in the VDR, the audit trail provides proof that a certain user access specific documents.• May be used against the target if documents are not made available to the buyer.
Dynamic indexing	<ul style="list-style-type: none">• Allows sellers to upload "late" documents to the VDR by efficiently placing them in their appropriate position in the VDR index; allows the seller to quickly reorder documents in the index and to inform potential buyers through email or SMS of changes to the index and data room contents. A complete change of the index however is not possible.• A significant improvement over the paper-based, manual indexing system and filing of PDRs, which were prone to errors and sometimes resulted in buyers not being informed of updates to data room contents.
Restricted use	<ul style="list-style-type: none">• In a PDR, the data room supervisor physically manages documents that may or may not be copied; in a VDR, digital documents are flagged as restricted with respect to copying, printing, downloading or viewing. Restrictions may be placed on certain portions of documents, and may allow for contingent restrictions, such as allowing a legal expert to download only legal documents but not financial documents.• Viewing restrictions may be placed on sensitive documents available only during a second round of due diligence.• A significant improvement in monitoring and ensuring the security of a data room, as well as reducing the costs associated with physically supervising a PDR.
Watermarking	<ul style="list-style-type: none">• A security feature for digital documents in a VDR; watermarking is the printing of certain words (such as the user's name) across the face of a document as identification and allows tracking of the document in the event of illegal distribution.
Variety of file formats	<ul style="list-style-type: none">• VDRs can usually store files of varying formats, including PDF, Excel, PowerPoint, Word, GIF, MPEG, JPEG, and TIFF, eliminating the need to convert files to a specific file type or the VDR system will transform the files into a specific format required by the system.

4.2 Evaluating the Effectiveness of Virtual Data Rooms

As the purpose of this research is to evaluate the use of VDRs and to recommend the best possible practices related to their implementation, we attempt to determine whether using a VDR improves the efficiency of an M&A deal in general, and whether it improves the efficiency of its users during the due diligence process. To answer the second question, we must put ourselves in the place of a PDR user and answer the questions that such a user may have prior to choosing between the modern or classical approach when assessing the necessary due diligence information. To this end, the next few paragraphs describe all possible practical and theoretical advantages and disadvantages to using a VDR.

Technically, the VDR user is the entity hiring a VDR provider regarding setting up a VDR and paying for the service—the target. However, the advantages and disadvantages of a VDR from the buyer’s perspective must also be considered, as it is the buyer who will offer a price for the target. That price may be higher by satisfying certain conditions of the buyer. Therefore, buyer needs regarding the use of a VDR versus a traditional PDR are as important as, and possibly more so than, seller needs. For this reason we consider the benefits of a VDR to both buyer and seller.

Before delving into the benefits and drawbacks of a VDR, understanding the position and objective of both buyer and seller in an M&A deal, and how they differ, is essential. In most M&A deals, the seller’s primary objective is to sell its company, a subsidiary or selected assets, for the highest possible price. On the other hand, the buyer’s objective, as explained earlier, is to determine whether to purchase the target, and if so at what price. These questions drive the buyer’s due diligence process. Since both sides have conflicting objectives, it should not be a surprise that most advantages for a buyer may be disadvantages for a seller, and vice versa.

The following table summarizes the advantages and disadvantages to both target and acquirer, as more fully described in the following sections.

Table 5. Advantages and Disadvantages of VDRs to Buyer and Seller.

	To Buyer	To Seller
VDR Advantages	Cost savings Time savings Comfort Transparency Fair playing field	Simplicity Ease of setup Cost savings Competitive price Legal compliance Time savings Security
VDR Disadvantages	Additional work Competitive price Reading documents online System speed Non-digital information	Security

4.3 Advantages to the Buyer

The main advantages of VDRs to the acquirer include cost and time savings, comfort, process transparency, and the ability to ensure equality among all potential buyers. In this section, we discuss each of these advantages.

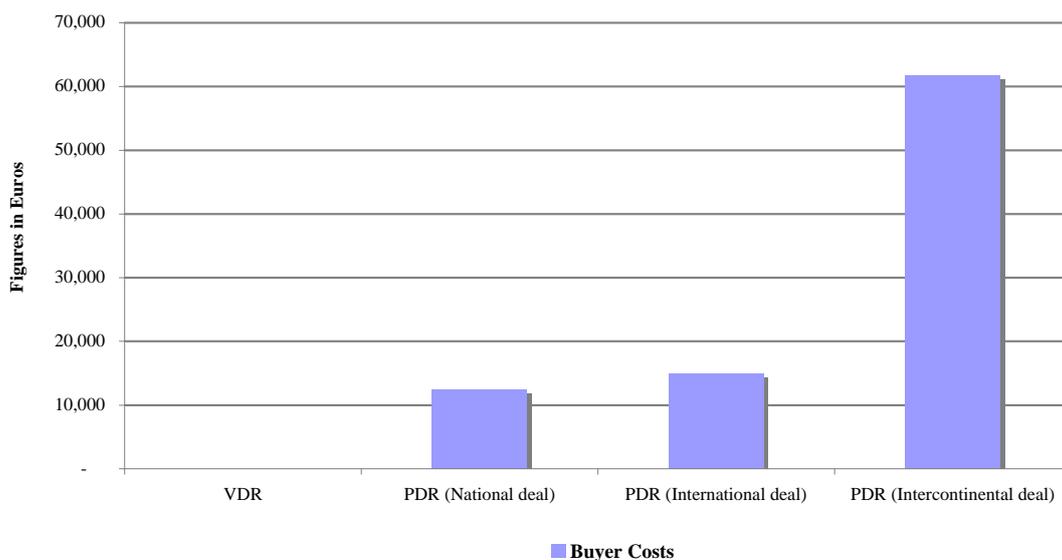
Cost Savings

VDRs indisputably bring multiple advantages over PDRs to buyers in M&A transactions. The most significant and measurable advantage is that of cost savings. As described earlier, to perform due diligence in a PDR, a buyer must be located at the data room. Unless the buyer is in the same city as the seller’s data room, travel and hotel expenses are incurred, along with the immeasurable costs associated with being out of the office and potentially unreachable for a period of time. Significant costs are incurred in cross-border transactions with buyers needing to travel internationally to PDRs at the target’s location.

With a VDR, travel and hotel costs related to the data room process are significantly reduced, and may only be incurred to attend the management presentation or other important person-to-person meetings. VDRs capitalize on the strengths of the Internet to eliminate the distance between parties.

To illustrate the cost differential between VDRs and PDRs for buyers, Figure 4 graphs data from national, international, and intercontinental transactions (assuming 10 members per due diligence team). The numbers are not exact and represent rough estimates of the major costs for each scenario. In addition, the costs are not total, as the costs of external advisers are the same for each scenario and are not included in these data.

Figure 4. Buyer Cost Comparison Between PDRs and VDRs (in Euros)



Source: Institute of Mergers, Acquisitions and Alliances (MANDA)

Time Savings

With access to a VDR and its search facility as described in Section 4.1, buyers experience significant reductions in the time spent searching for documents, as well as searching for topics, words, and phrases within documents and throughout the data room. Teams doing research in a VDR have the opportunity to utilize the time spent in a data room more effectively than teams working with PDRs, and can spend their time on critical tasks, such as data analysis and valuation work, that depend on data from the data room.

Data room process flexibility is greater for buyers in a VDR than in a PDR. Buyers may study the information in greater detail and for longer periods of time, as

VDRs stay open longer than PDRs, on average between three to six months. In contrast, a buyer's team in a PDR is often allowed just two to five days of access. Additionally, a VDR is open 24 hours a day, while a PDR often provides limited access (e.g. 10 hours a day), given staffing and physical resource constraints.

Therefore, the flexibility offered by a VDR allows the buyer to decide on the scope and extensiveness of the due diligence effort made. The buyer may choose to perform a longer and more extensive one. For PDRs, the buyer however does not have the luxury of making a choice about the depth of the due diligence performed. In a PDR, the due diligence team must concentrate on gathering and reviewing as much data as possible in a short period, likely resulting in lower quality due diligence.

Comfort

Performing any work or activity, not just due diligence tasks, in a comfortable and productive environment is believed to have many positive effects on employee satisfaction—which of course is closely related to their productivity. The VDR due diligence process lets potential buyers work in familiar office or home environments, resulting in less travel-related stress and a higher level of comfort and productivity. Therefore, performing due diligence in more relaxed conditions, such as that provided by a VDR, will likely result in experts being more thorough and more diligent than if inspecting documents in a PDR.

Additionally, accessibility to a VDR 24 hours a day, 7 days a week greatly enhances the productivity of team members who are more efficient working at night than during conventional working hours.

Transparency

The advantages related to the increase in transparency resulting from technology and approach of a VDR are significant and numerous. In this section, we elaborate on only the most important advantages.

VDR transparency results from the audit trail feature used by the seller and from the digitalized approach provided to the buyer, both benefits of the Internet technology used by a VDR. In a VDR, all actions by both parties are recorded electronically, unlike the manual work done in a PDR, and can be tracked, verified, proven, and referred to at any time, thus ensuring the transparency of the process. In this sense, a VDR allows everyone's behavior to be "black and white."

Increased transparency also means improved communication between buyer and seller during the entire process, as all correspondence is made "official" when saved in written form by the VDR. Increased transparency also results in decreased information asymmetry between buyer and seller. Moreover, increased transparency sets new standards previously unthinkable for physically performed due diligence. Criminal behavior is greatly limited, as buyers are unable to steal or mishandle documents in other ways and sellers are unable to give certain buyers privileged or unfair access during the selling process.

Fair Playing Field

If there is only one PDR, multiple buyers access to the data sequentially, which may create inequalities in terms of the amount of time following due diligence that a buyer has for analysis and decision-making. In other words, buyers with early access to the data room will have more time to analyze the information in a data room and to gather additional information not in the data room by utilizing unconventional

methods to retrieve such information. Teams scheduled later will have less time for analysis and this may reflect negatively on their binding offers and seriously decrease their chances of realizing a deal.

In a VDR, all teams have the same access to the same information at the same time. Therefore, the VDR creates an even playing field and improves the efficiency of the process for all involved, at least in terms of information processing.

4.4 Advantages to the Seller

The main advantages of VDRs to the acquirer include simplicity, ease of setup, cost, final price, legal compliance, time, and security. In this section, we discuss each of these advantages.

Simplicity

Most sellers' management teams decide on using a VDR because of its simplicity of use. When seller management is faced with the issue of how to execute its sale transaction, aside from cost, process simplicity is the key concern. Sellers choose to simplify the selling process and use methods that are least prone to mistakes, systematized, quick, require less effort, and leave no room for surprises. A VDR is the solution that meets these criteria.

A VDR eliminates some work necessary to set up a PDR. Finding and renting office space, hiring supervisors and copiers, maintaining secure conditions, and populating the room with documents are just a few of the required tasks that are eliminated when using a VDR.

Ease of Setup

Whether one of the two methods, the PDR or the VDR, is faster to set up depends on several factors. For both PDR and VDR, the setup process may begin during the preparation and pre-due diligence stages with the collection of documents. In this comparison, we assume that the actual start of the setup process is when the first data room activities begin. For a PDR, this is when the search for an office space occurs or when the first delivery of documents occurs (for internal office space used). A VDR officially begins its setup when a VDR provider is first contacted. The entire setup process ends when the data room is ready for use.

Theoretically, both types of data rooms may be set up in less than 72 hours, and the average setup time for both based on actual M&A deals is up to two weeks. This setup time of course varies with respect to preparation of documents and size of the data room. In the case where more than one PDR is being set up because of multiple potential buyers, preparation time is extended. A significant amount of this time is spent making at least three copies of documents (assuming that all documents are copied versions in data rooms). With a data room consisting of 100,000 pages, the difference in setup time can be significant for two or more data rooms.

Thus, in the case of setting up a PDR, setup time changes as the number of potential buyers changes and as the magnitude of the deal changes. With a VDR, these factors do not affect setup time.

Cost Savings

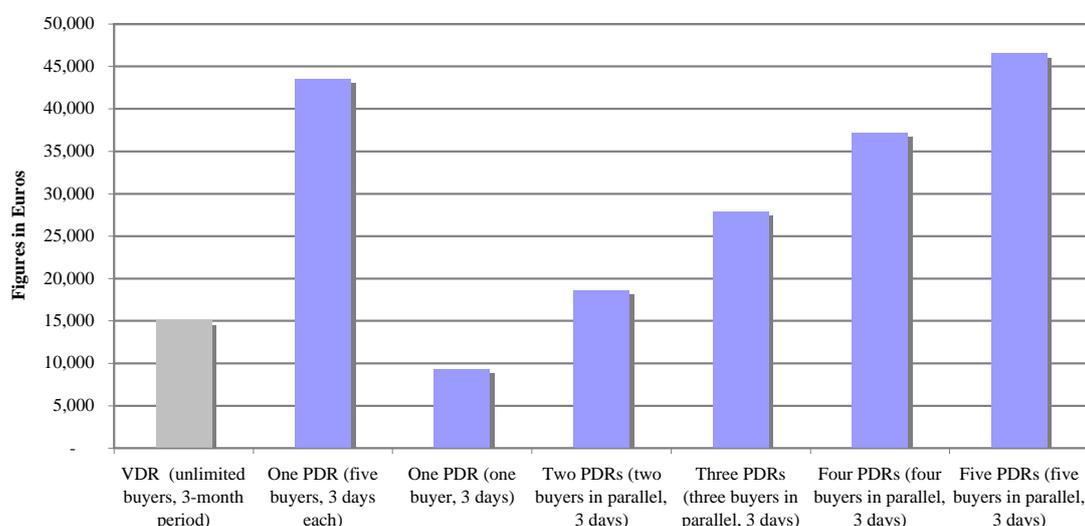
Similarly for the buyer, lower costs associated with VDRs are major advantages for a seller compared with PDR-related costs. We have again made a rough estimation of costs usually incurred by the seller in an average M&A

transaction. We did not include the relatively high labor costs in this analysis, as they are the same for both VDRs and PDRs.

This comparison reveals that seller costs in an average M&A transaction are lower when using a VDR versus a PDR. Using a PDR is less expensive in deals where only a single data room is used for a small number of potential buyers. However, the less expensive VDR approach is recommended over the more costly multiple-PDR setup in larger deals.

Figure 5 compares relationships between different VDR and PDR usage scenarios. This comparison also reveals that using a single PDR sequentially (for a longer period) is less expensive than using five PDRs in parallel (each for a shorter period), primarily because of the higher document printing costs and the fixed costs associated with each additional PDR used.

Figure 5. Seller Cost Comparison Between PDRs and VDRs (in Euros)



Source: Institute of Mergers, Acquisitions and Alliances (MANDA) Research

A VDR presents another advantage to the seller in that the number of potential buyers can be higher because of technical or cost constraints are lower when compared to a PDR. Of course other costs associated with a higher number of bidders outside the data room may increase such as answering questions in Q&A or management presentation, but these costs are the same for VDR vs. PDR. When a VDR is used in an M&A transaction, the number of potential buyers—in particular financial investors—tends to be greater. The absence of the cost limitations together with fast and easy document accessibility through a VDR produces higher demand from potential buyers, which may ultimately result in higher offers than if there were fewer interested parties.

Final Price

A larger number of potential buyers creates a more competitive situation and hence is likely to result in a higher final price. Although quantifying the difference in final prices between deals with few versus many buyers is difficult, an upward trend in price may be expected as the number of buyers increases. Since the possibility of more buyers is higher when using a VDR, a seller using a VDR may expect a higher final price, although this may not always be the case. Moreover, this scenario is

possible only with auction-type processes, where multiple potential buyers are involved.

Legal Compliance

Using a VDR makes complying with legal standards (such as the Sarbanes-Oxley Act) easier, as the VDR provider likely has document presentation templates that are legally acceptable. The seller has the obligation to make available all documents required by law, and the provider has the obligation to make them accessible to buyers. The complete VDR, its documents and interaction can be stored on a DVD or any other storage medium after the M&A process is completed. This copy is easy to create and to store and can serve as evidence in the case of legal dispute.

Time Savings

An M&A process that uses a VDR has the theoretical advantage of being shorter in duration because fewer manually intensive activities must be carried out by the seller. A potential buyer experiences significant time savings when using a VDR, and the seller also benefits by not having to spend time printing, supervising and assisting, as they are required to do in a PDR. The time saved by outsourcing certain activities is particularly beneficial for the seller who may, if necessary, speed up the selling process—unthinkable when using a PDR. If for some reason a target must complete the selling process in a very short period, this can theoretically be accomplished by giving buyers two days' access in a VDR. With a VDR, the time savings to both parties may result in a shorter M&A transaction process.

Improved Security

Security is the VDR's greatest strength and most significant weakness. Many of the negative perceptions of a VDR's security (to be discussed later) are a result of reluctance on the part of sellers to post their data online. However, a VDR is a much more secure method of exchanging documents between buyer and seller compared with a PDR. The seller should place confidence in a VDR security system based on security measures such as passwords, firewalls, encryption, fingerprinting, other methods of recognition, and other measures that result from the latest advancements in technology.

4.5 Disadvantages to the Seller

The main disadvantage of VDRs to the target is the issue of security, as discussed below.

Security

Today's corporate world has become increasingly concerned about security, especially large companies. In today's world where information is everything, companies invest significant sums into maintaining the confidentiality of sensitive information. In this environment, we are witnessing the emergence of the VDR, which is established on concepts that give the impression of serious endangerment to data security. As previously described, two aspects of a VDR create this impression: first, a VDR provider company usually scans and uploads corporate documents and, second, given the benefits of a VDR, more potential buyers may be allowed into the process without hindering a deal's time to completion. Therefore, with a VDR, more people have access to confidential information compared with a PDR. For this reason, growth in VDR usage has not been higher.

The security concerns—spying, confidentiality abuses, misuse of information—that come with giving a single potential buyer access to sensitive information are multiplied with multiple potential buyers involved. The seller must decide on whether taking the risk of letting numerous potential buyers into the data room is worth the possibility of realizing a higher final price. As we concluded earlier, more potential buyers may result in a higher final price. The only certainty involved is that security risks increase with VDRs as, on average, more potential buyers are involved.

Another security disadvantage of a VDR relates to access. There is no way to guarantee that a buyer team member with access to the VDR will not take the opportunity to allow a friend or colleague who may work for a competitor to glance at confidential documents. Such a security violation may result in serious damage to the seller. However, the risk of this occurring can be minimized to a certain extent by developing strong, trustful relationships with potential buyers and by giving only the serious buyers access to the most sensitive information.

Although realistic security issues exist with VDRs, many other perceived issues result from ignorance rather reality. For example, the risk of a VDR being hacked is no higher than the risk of a PDR being burglarized. Therefore, if the risks outlined above are partially managed by seller, which to a great extent can be done, and if they are financially acceptable risks, a VDR is a rather secure and quite beneficial tool to use when selling one's business.

4.6 Disadvantages to the Buyer

The main disadvantages of VDRs to a buyer include price issues, online reading of documents, system performance, access to information that cannot be digitalized, and outsourcing of seller activities. In this section, we discuss each of these disadvantages.

Competitive Price

A higher final price resulting from a larger number of buyers, although not quantifiable, represents a considerable VDR-related disadvantage to a buyer. Although a VDR improves due diligence efficiency and deal transparency, a buyer's final offer may not be any more accurate, as the winner in the end is the buyer who pays the most (all other transaction terms being equal). Thus, transactions become more inefficient, in contrast to economic theory that presupposes that more competitors increase process efficiency. Our findings show that offers made in auction processes using a VDR tend to be less "realistic" than when a PDR is used, purely a result of the tendency to overpay to win when competing against a large number of potential buyers. In the end, buyers who lose are those offering the most "realistic" prices.

In this context, we emphasize that a target has no true value; in other words, a target has a different value to every acquirer and the concept of an entity's true value is purely theoretical in nature. In reality, no single true value exists, because each acquirer has its own future plan for the target, depending on its own resources as well as its ability and plan for integrating the target into its business to enhance its own value in the future.

Reading Documents Online

The majority of data room users in our research highlighted another major disadvantage of VDRs, and that is reading documents displayed on a computer screen. Many users stated that they read information slower when on a computer screen versus in printed form. Therefore, reading documents online is a disadvantage to buyers in terms of speed and accuracy when using a VDR.

This disadvantage is a result of the human eye tiring much sooner from staring at a monitor than from reading information on a piece of paper. In addition, eye fatigue adversely affects the efficacy of buyer team members, as human errors related to skipping over important figures and failing to see certain information are more likely to arise.

For this reason, “old school” users are the largest opponents of VDRs. Many people, especially older employees and both former and potential data room users, still prefer reading from paper form over electronic form. This remains a major resistance to the use of VDRs, and is a significant disadvantage of a VDR from the buyer’s perspective.

System Performance

Buyer team experts often complain about the time needed to display on screen the documents stored in a VDR. In this sense, a VDR is inferior to a PDR, as the average display speed for two online pages in a VDR is between two and five seconds, and in some cases longer. In a PDR, where physical page turning takes place, the equivalent display speed is less than half a second. Online display speed is a function of server performance and may be significantly faster than stated above. However, physical review of documents is much faster than online review. Accordingly, within the same timeframe, a team in a PDR can review a larger number of documents than a team using a VDR.

Non-Digital Information

The inability for a VDR to allow review of information that cannot be digitalized, such as soil samples, product samples and other samples in specific industries, may be problematic for a buyer, especially with cross-border deals. To review the samples, a buyer would either have to travel to the seller’s location or the seller would have to mail such samples to the buyer, with either option incurring additional costs.

Outsourcing of Seller Activities

A relatively insignificant disadvantage that a VDR brings to a buyer is the need to do one’s own copying and printing. In a PDR, seller representatives assist with copying of documents; in a VDR, most such actions are outsourced to the buyer while accessing documents online. Therefore, a buyer bears the cost to print and copy, which may be viewed as a minor additional entry barrier for acquirers in an M&A deal. A buyer located in the same city as the seller would experience the highest incremental increase in due diligence costs. With a PDR, a local buyer has no travel or hotel related costs; however, with a VDR, the local buyer now incurs increases in copying and electricity costs.

4.7 Virtual Data Rooms and their Value-Add to the M&A Process

While we agree that a VDR benefits its users, we cannot categorically confirm that VDR usage increases the overall efficacy of the M&A process. However, certain process changes resulting from the use of a VDR that might add value to the M&A process include:

- From sequential to parallel inspection;
- Improvements in process quality;
- Reduction in transaction duration; and,
- Theoretical benefits.

Aside from the obvious differences between M&A processes using a VDR versus a PDR, whether and to what extent a VDR adds value during the due diligence stage depends on many factors. The second and third points above are mutually exclusive and whether any of the above-mentioned process changes will add value to the overall M&A process depends exclusively on the seller's decision.

From Sequential to Parallel Inspection

The benefits from a shift in buyer access to a data room from sequential (through a physical data room) to parallel (through a VDR), depends on the number of VDR users. In the case of a single buyer, duration of the due diligence process does not change significantly; however, if multiple buyers are involved, more substantial changes in access to the data room and duration of the overall M&A process can be identified. Therefore, VDR's can be exploited to its full potential when multiple potential buyers are involved in an auction-type transaction process.

Improvements in Process Quality

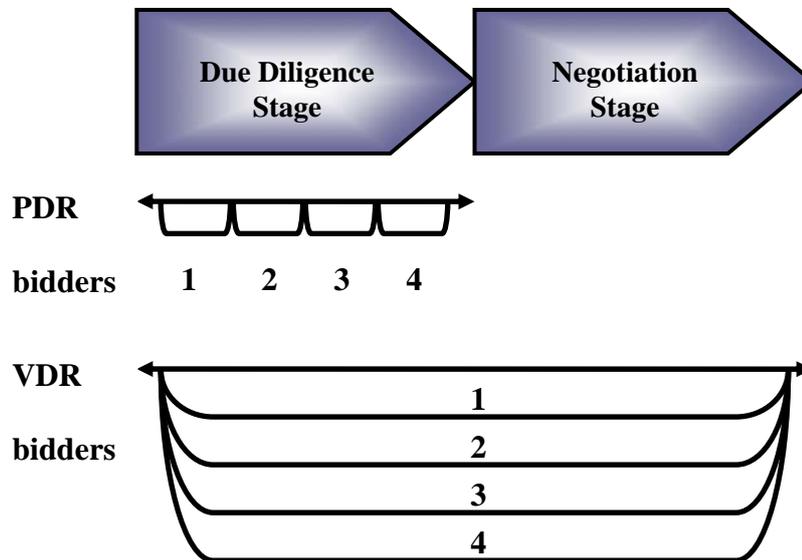
Theoretically, a VDR's advantage over a PDR is enormous and a result of the duration of the inspection allowed. As described earlier, a buyer is permitted access to a PDR a limited amount of time (often around three days), while the average inspection time permitted to a buyer in a VDR is usually much longer (often weeks). During this extended period, the acquirer can gather more information to help assess the risks and benefits of a deal. This may not be the case if the seller allows the same inspection period for a VDR as if a PDR had been used, resulting in almost no added benefit gained without extended access to the data room. However, because a VDR is available 24 hours a day, as opposed to the usual 10 hours a day for a PDR, a buyer may still benefit by being able to control the scope and extensiveness of its due diligence. Although open for only three days, a VDR provides continuous access during those three days and utilization of inspection time in a VDR is much greater, at the option of the buyer.

We examine the theoretical impact from longer access to a VDR than to a PDR, which occurs in most deals. Even assuming that the deadline for submitting a binding offer is the same for buyers with access to either a VDR or a PDR, buyers in a VDR have the advantage that the VDR usually stays open after the deadline, as there is no incremental cost to the seller of doing so. This may be helpful to a buyer during the negotiation process.

A longer inspection period for a potential buyer results in a more detailed and complete due diligence, from which a "better" outcome—the final price—is likely to arise. Due diligence quality may improve if longer inspection periods and parallel

inspections are available. A VDR fulfills these conditions (see Figure 6). Thus, due diligence in a VDR is of higher quality than due diligence in a PDR. Consequently, since due diligence quality directly influences the final outcome of an M&A deal, we deduce that VDR usage increases the overall quality of an M&A process.

Figure 6. Inspection Time per Buyer Team: PDR (Sequential) vs. VDR (Parallel)



Shorter Transaction Duration

A third major potential benefit that a VDR brings to an M&A process relates to shortening the duration of a transaction. However, two conditions must be met to realize this benefit. First, the deal must be an auction process, with multiple bidders involved. Second, only one PDR would have been used. Under such conditions, the theoretical benefit of a shorter duration of an M&A process by using a VDR may be achievable in practice.

A reduction in the duration of a transaction achieved by using a VDR is a direct result of the greater time utilization that a VDR allows because of its technological advantages over a PDR. Theoretically, if a buyer wants to process the same number of documents in a VDR as in a PDR—implying that the buyer desires the same quantity of information utility—a buyer would have to spend more time in a VDR because of slower processing related to reading documents on a computer screen. However, experts are still able to process more information in one day of due diligence in a VDR because of its 24/7 availability. A PDR is available for one-third or at most one-half that time on a daily basis.

Combining the main advantages of a VDR, including the possibility of greater time utilization per day and the ability to serve users in parallel, means that the seller may shorten the inspection period without compromising buyer due diligence. This would result in a shorter VDR period for all potential buyers, but still be longer than if a PDR had been used. Although potentially challenging, for buyer teams to work longer than the average 8–10 hours per day (possibly 12 hours) is manageable. The average VDR user can achieve greater information utility per day compared with the average PDR user and a reduction in the duration of an M&A transaction is a direct result of this enhanced information utility. This reduction in the duration of a deal can

bring numerous benefits, such as lower opportunity costs of resources involved from both parties and earlier realization of synergies to the buyer.

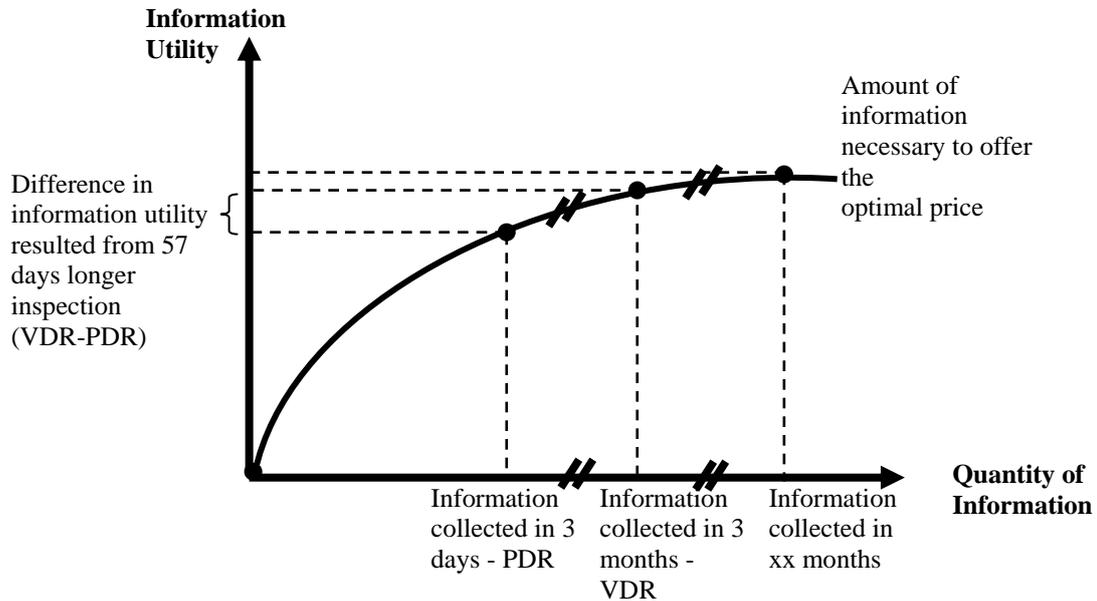
Theoretical Benefits

Increase in information utility. Figure 7 shows the relationship between the information benefit (or the information utility as we called it here), a result of document inspections during the due diligence process, and the time variable represented by the quantity of information collected. The model shows that the quantity of information collected grows as time passes, allowing the buyer to achieve greater information utility. This ultimately results in a higher probability of attaining the optimal offer price, again a result of the specific amount of information absorbed by the buyer. The theory presupposes that with sufficient time, assuming that all teams have similar competences, skills, average industry expertise, knowledge and objectives, then each team can create a more or less realistic picture of the target company and its value. This realistic value, excluding the value ascribed to the target from the acquirer's specific characteristics, and the synergies and integration benefits unique to each buyer, is our "optimal price".

This model assumes that both a VDR and a PDR have the same information benefit curve, or that a due diligence team's time utilization is the same in both types of data rooms. Differences might arise from possible differences in productivity depending on whether a team works in a PDR or a VDR. Teams in a VDR have more time to perform due diligence and tend to be less productive per day of work as their work is stretched over a longer period. These teams also tend to be more productive because of the technological benefit that VDRs offer, such as increased search capability and transparency. On the other hand, teams in a PDR have more concentrated and intensive work, making them more productive per day of work, but a lack of technological benefits decreases their productivity.

As a result, if we accept this argument as true, VDR and PDR productivity differences in terms of generating information utility per quantity of information is small, if any. Therefore, the model has only one information benefit curve for both VDR and PDR due diligence approaches and explains why a VDR's major benefit over a PDR is its longer inspection period allowance.

Figure 7. Information Utility per Buyer



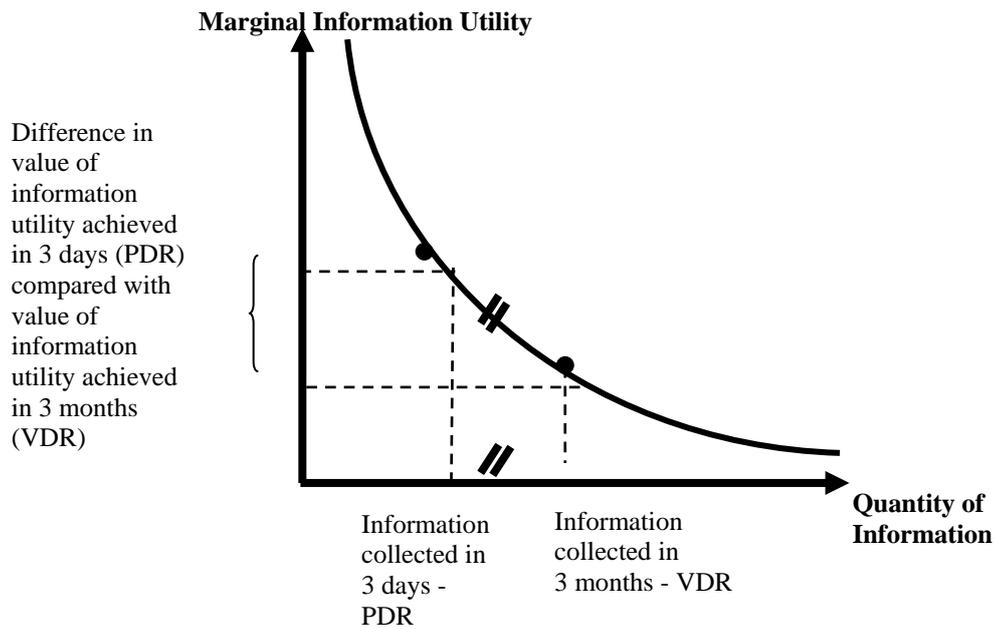
If the graph is realistic, then a VDR has greater efficacy over a PDR at least in collecting the quantity of information adequate to offer an optimal price in a deal. As the period for inspection in a VDR is on average longer than in a PDR, access to a VDR should result in a more realistic offer. We say “should” because in reality, as mentioned earlier, the opposite may happen as offers in deals using VDRs tend to be overvalued as a result of the larger number of buyers and offers. Consequently, the larger the number of offers, the greater the probability that some of the offers will be overvalued.

Having examined the behavior of an information utility curve relative to different inspection periods for a VDR and a PDR, we can now examine how the same difference in conditions affects marginal terms. By showing the marginal change in the information utility of each additional piece of information collected, we want to show how, at least theoretically, the value of each additional piece of information changes.

Decrease in marginal utility of information. Figure 8 shows the marginal change in information utility over quantity of information collected. The graph specifically shows that information utility decreases as the quantity of information increases. In other words, the information utility of a unit of information (usually a document) collected to a buyer is lower than the information utility of the previous unit of information collected. As on the previous graph, time is represented by quantity of information collected, which more precisely reflects the decreasing information benefit per each subsequent unit of information.

Therefore, the graph implies that the documents reviewed early in the due diligence process by a due diligence team are the most informative and hold the greatest influence in creating a view of a target. These documents contain the most important information such as earnings potential, legal standing, past trends of the company, etc. As time goes by, less important documents are reviewed and alter a buyer’s general perception of the value of a target in only a minor way.

Figure 8. Marginal Change in Information Utility based on Quantity of Information Collected



By accepting these theoretical conditions as true, we can correlate quantity of information and time, which shows that the longer the inspection period allowed per team, the more information the team is expected to gather. This is also empirically true. However, since information utility, as we call value of information, falls as quantity of information collected increases, we can extrapolate that the value of information falls as the time spent on inspection increases.

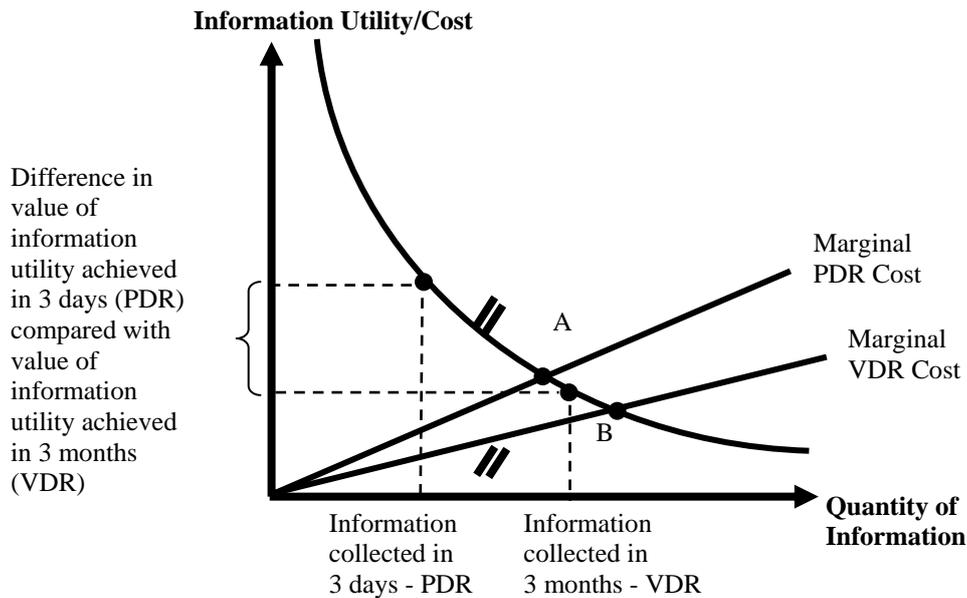
Earlier definition of optimal price. We define another theoretical benefit of a VDR. A VDR allows its users to define the optimal price much earlier than a PDR user is able to. This benefit results directly from increased transparency and document search capability in a VDR, allowing the target to conduct more precise valuation analysis in a shorter period.

In reality, this may not be the case, as in most situations, buyer productivity is somewhat lower. In a longer inspection period, experts may not necessarily concentrate on the most important documents in the beginning of the due diligence process as they do in a PDR, where they face a limited inspection period. Therefore, the marginal information utility curve for a VDR in reality may look somewhat different than our theoretical assumption.

Increasing marginal costs. Finally, we analyze how marginal costs for a VDR and a PDR change in terms of quantity of information collected. This analysis will reveal which of the two approaches is less expensive over the duration of the due diligence.

Further developing the previous graph by adding in marginal costs for both VDR and PDR results in Figure 9. The graph shows the marginal cost behavior of both VDR and PDR usage. As expected, observing the changes in cost over time, indicated as quantity of information collected, shows an increasing marginal cost. The upward slope suggests that the more information collected, the greater the costs. Both cost curves start from zero because here, only marginal costs are analyzed, and initial costs related to travel and the fixed cost of consulting resources were excluded.

Figure 9. Marginal Change in Information Utility based on Quantity of Information Collected



Furthermore, as seen through actual situations, PDR costs increase faster than VDR costs as the quantity of processed information increases. Buyer costs in a PDR are higher than in a VDR, as discussed earlier. Therefore, each marginal unit of information costs more to collect in a PDR compared with in a VDR, resulting in an increasing difference between VDR and PDR marginal costs as the number of units of information collected increases.

In Figure 9, the PDR marginal cost curve intercepts the marginal utility curve at point A and the VDR marginal cost curve intercepts the marginal utility curve at point B. These intercepts mark the point after which continuing to collect information is not economically beneficial. Since the PDR marginal cost curve intercepts the marginal utility curve before the VDR marginal cost curve, for a PDR process to be economically beneficial, less information should be collected. On the other hand, VDR equilibrium is to the right, implying that more information can be collected while remaining economically feasible. If we agree that more information absorbed at economically acceptable costs decrease information asymmetry between buyer and seller, the VDR, which allows more information at economically acceptable terms, results in a more efficient M&A process.

5 CONCLUSION

After examining the benefits and issues related to using virtual data rooms in M&A transactions, we find our that our conclusion is best described as contingent. If a potential VDR user asked whether or not using a VDR as the data room tool in its sale process was beneficial, our answer would depend on many factors.

One might ask why the traditional, less useful yet more prevalent PDR is not categorically pronounced superior and therefore set as the standard for data rooms. Several answers exist, but fundamental to a VDR is that the essence of due diligence—essentially to examine documents—is not altered by its use. Although a VDR is in many ways better and more economical than a PDR, its fundamental purpose is unchanged compared with PDR. VDRs, being very similar to PDRs in this

sense, have not replaced PDRs overnight, although the benefits of migrating to new technology have been recognized.

In comparing VDRs and PDRs, a VDR demonstrates concrete advantages over a PDR for several specific types of transactions: larger transactions, auction-type processes with a large number of potential buyers, international and cross-border transactions, and transactions in which a limited period exists for due diligence. These types of deals benefit from the use of VDRs because the key advantages of a VDR over a PDR are (a) its ability to allow parallel access to the data room by multiple buyers, which also eliminates the costs associated with setting up multiple data rooms, and (b) the decrease in travel-related expenses by offering continuous and ubiquitous access to buyers regardless of location.

Other theoretical benefits to using a VDR exist, such as potential higher final offer prices and increases in information utility through a longer due diligence period. However, these additional theoretical benefits are difficult to quantify in today's environment. The prevalence of "old timers" and their involvement in M&A transactions will continue to result in a growing acceptance of the VDR as a standard tool for due diligence in M&A transactions. However, as technological advances continue to contribute to our professional and personal productivity and change the way we work and live—and are able to resolve some of the current disadvantages related to using VDRs—and with an ever-increasing number of cross-border transactions being undertaken in today's trend towards globalization of the business community, we expect that VDRs will become the accepted and most widely used data room tool for M&A transactions.

APPENDIX A: DATA ROOM INFORMATION

As discussed in Section 3, the documentation and other resources in the standard and obligatory categories included in a PDR from both a legal perspective and a valuation perspective are as follows. Please note that this list is not exhaustive, but highlights the critical documents and information provided in a data room.

- **Financial statements:** balance sheet records, all past income statements, cash flow statements, tax materials, projected financial information and other financial documentation.
- **Corporate books and records:** incorporation statement, charter and by-laws, shareholders, qualification and registrations, reports to shareholders, minutes of meetings, officers' and directors' questionnaires prepared in connection with the most recent proxy statements⁶.
- **Contracts, agreements and arrangements:** documents related to key stakeholders, such as suppliers and key customers; marketing-related contracts and agreements; material sales representative agreements; joint venture and partnership agreements.
- **Insurance:** list and description of all material property, casualty, liability and other insurance policies, history of all insured claims including paid, reserved, and related expense amounts, loss runs for workers' compensation and general liability, loss history for any self-insurance, loss prevention/control recommendations made by insurers, brokers or consultants⁷.
- **Employee information:** organizational chart, employee benefits including bonus retirements, profit sharing, incentive compensation plans and agreements including retention agreements, agency agreements, collective bargain agreements, etc.
- **Property and equipment statements:** lists with statements of purpose, location and description of property and equipment owned, lists including all terms of all leased property and equipment as well as all property and equipment under mortgage
- **Operations, sales and marketing statements and records**
- **Legal matters**
- **Governmental and environmental compliance:** list of all material government permits and licenses, any correspondence between the company and regulatory authorities, copies of all environmental inspections, audits and other reports⁸.
- **Other materials:** e.g., press releases and other media-related information.

⁶ http://www.1000ventures.com/venture_financing/due_diligence_checklist_byvpa.html.

⁷ Ibid.

⁸ Alexandra Reed Lajoux & Charles Elson (2000): *The Art of M&A Due Diligence*, New York: McGraw-Hill, p. 45.

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