Cloud, on-prem, or hybrid: choosing the right VMS approach

Understanding the unique advantages of each

May 2024 | Axis Communications, Inc.

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Summary

Businesses have many options when choosing a video management system (VMS). This white paper will examine the three primary categories into which modern VMS solutions fall: on-premises, cloud, and hybrid. Each option offers unique advantages and disadvantages depending on the specific needs of the organization—there is no "right" or "wrong" answer. But making the right decision isn't always easy. Before making a decision, it is critical for customers to understand the ways that each option may be able to meet their needs.

Introduction

There are many reasons why a business may be exploring VMS options. They may not have a VMS, they may have an issue with their current VMS, or they may just be exploring opportunities to upgrade.

Many businesses begin to explore their options in response to a specific incident, such a cyberattack or a new investment. This makes sense, but it also isn't always the best time—it risks framing the entire decision around the incident looming large in everyone's mind. It's best to take a more holistic approach to the decision-making process, taking all needs into account and engaging in thorough, comprehensive research.
A business's needs can vary widely based on factors like industry, regulatory landscape, and specific security needs. Some businesses may only need a VMS that performs basic functions, like recording and reviewing video. Others may need a VMS to obtain insurance or may need to retain data for a predefined length of time under the law. Or the organization may simply wish to improve their ability to gather and review data pertaining to their businesses. Whatever the case, the business's motivation will impact which VMS is the right choice.

This paper will explore the three primary VMS models: on-premises, cloud, and hybrid. It will walk readers through the differences between them, and the advantages and disadvantages they may have in certain situations. While reviewing this information, it's important to remember that one model isn't necessarily "better" than another—the best solution for a given business is entirely dependent on its individual goals and needs.

VMS MODEL 1:

On-premises solution

An on-premises video management system (VMS) involves a video server that houses the stored video and is physically located at a customer's site. It requires a climate-controlled environment and usually involves physical devices hardwired and directly connected to a central server.

Advantages

Easy access to video. One of the primary advantages of an on-premises solution is that users have easy access to video: stored videos can be viewed at any time by locally accessing the server. Retrieving video from an on-site server or through the Local Area Network (LAN) generally requires a less robust infrastructure, as it does not need to route data through the Wide Area Network (WAN) or the cloud. This makes video retrieval considerably faster.

Control over the system. There is also an added degree of control, as the owner of the system controls the environment and can personally ensure that the server is cared for and maintained. What's more, there is no need to worry about service outages preventing access to video, and users are not at the mercy of an internet service provider (ISP). Even amid an internet outage, users can still access necessary video—which can be important in an emergency situation where service might be spotty, such as an extreme weather event. Skilled IT teams can also exercise more direct control over the system's cybersecurity measures, which can be a potential advantage.

Retention time. Retention time is often a consideration for organizations. An on-premises solution allows the organization to configure servers for longer retention time without cloud storage fees increasing dramatically. They can also set up RAID mirroring hard drives to ensure adequate backup in case of data loss. Some organizations may need to store and access video for two years or more, and an on-premises solution may allow them to do so more affordably.

Lower long-term cost. On a similar note, long-term cost can be lower for on-premises solutions. The cost of an on-premises solution is primarily based on a one-time hardware fee, while cloud solutions are based on a subscription model. Up-front cost is therefore minimal for cloud solutions, but over time the cloud will likely become more expensive. Businesses with the resources to shoulder higher up-front costs may prefer to do so rather than face perpetual subscription fees.

Ease of retrofit. Another advantage that on-premises VMS solutions have is ease of retrofit. Thanks to modern encoders, organizations can easily retrofit older analog cameras with IP devices without major changes. Facilities with large numbers of older cameras may not have the time or resources to replace them all at once. By replacing the VMS and adding a Network Video Recorder (NVR), upgrading smaller groups of cameras at a time can spread out the cost and make upgrading more affordable and palatable.

Disadvantages

Higher up-front cost. As previously mentioned, the up-front cost of an on-premises VMS solution can be significantly higher than the other options. Servers may be expensive, and video storage may require a great deal of memory. The size of the server needed to support a solution will depend on factors such as overall number of devices, video quality, recording parameters, compression technology, and desired retention time. A user seeking to store video from a high camera count for over a year will need greater storage with the ability to expand further, which may lead to a larger server being required. In addition, maintaining the server room itself can be expensive. Organizations need to consider the cost of building and maintaining a climate-controlled environment, not to mention the security upgrades needed to restrict access to the server.

Maintenance needs. Maintenance costs are also a concern for on-premises solutions. Servers and devices need to be maintained and updated, which means users need to stay on top of product recalls, discontinued products, software and firmware updates, and cybersecurity protections. This requires a significant knowledge investment, and smaller businesses may not have the in-house expertise needed to maintain or calibrate devices appropriately. In most cases, equipment should be maintained by a licensed systems integrator or direct IT resource, which can be cost prohibitive.

Use-case expensive. On-premises solutions are also use case-expensive. Small businesses with five locations needing only 30 days of storage may not want to invest in an expensive server for each location. On the other hand, a business with too many cameras may run out of channel count and need to purchase a second server, which would double the initial investment. This illustrates the wide variation in potential costs depending on the specific use cases for the solution.

Who Should Be Interested?

Those in need of a retrofit. The ease of retrofitting an on-premises solution makes it an easy choice for businesses with existing (but outdated) equipment. An on-premises solution can easily accelerate the process of digital transformation and enable a quick pivot to internet protocol (IP) video.

Those with specific regulatory needs. Businesses in certain industries, such as controlled substance distribution, may need to comply with regulations mandating that video be retained for a certain length of time. Those regulations often mandate on-premises storage, but an on-premises solution also tends to be the more affordable option. A pharmacy or cannabis distribution business may need on-premises storage to retain their license to do business at all.

Those who desire lengthy retention times. Even without a regulatory mandate, many businesses want to store video for longer than is feasible with a cloud solution. For instance, building and property managers may wish to protect themselves by retaining video for a length of time that matches the statute of limitations for slip/trip/fall cases or other potential liabilities. Preventing a costly lawsuit can easily be worth the costof the initial investment.

Those who want or need to physically secure their server. Government entities and law enforcement agencies, for example, often do not want to rely on the cloud. It is important for them to be able to access evidence at any time and not be beholden to an ISP, which would be required to access cloud recordings. It is also important for law enforcement organizations to be able to physically secure servers to prevent tampering and maintain the chain of custody over evidence.

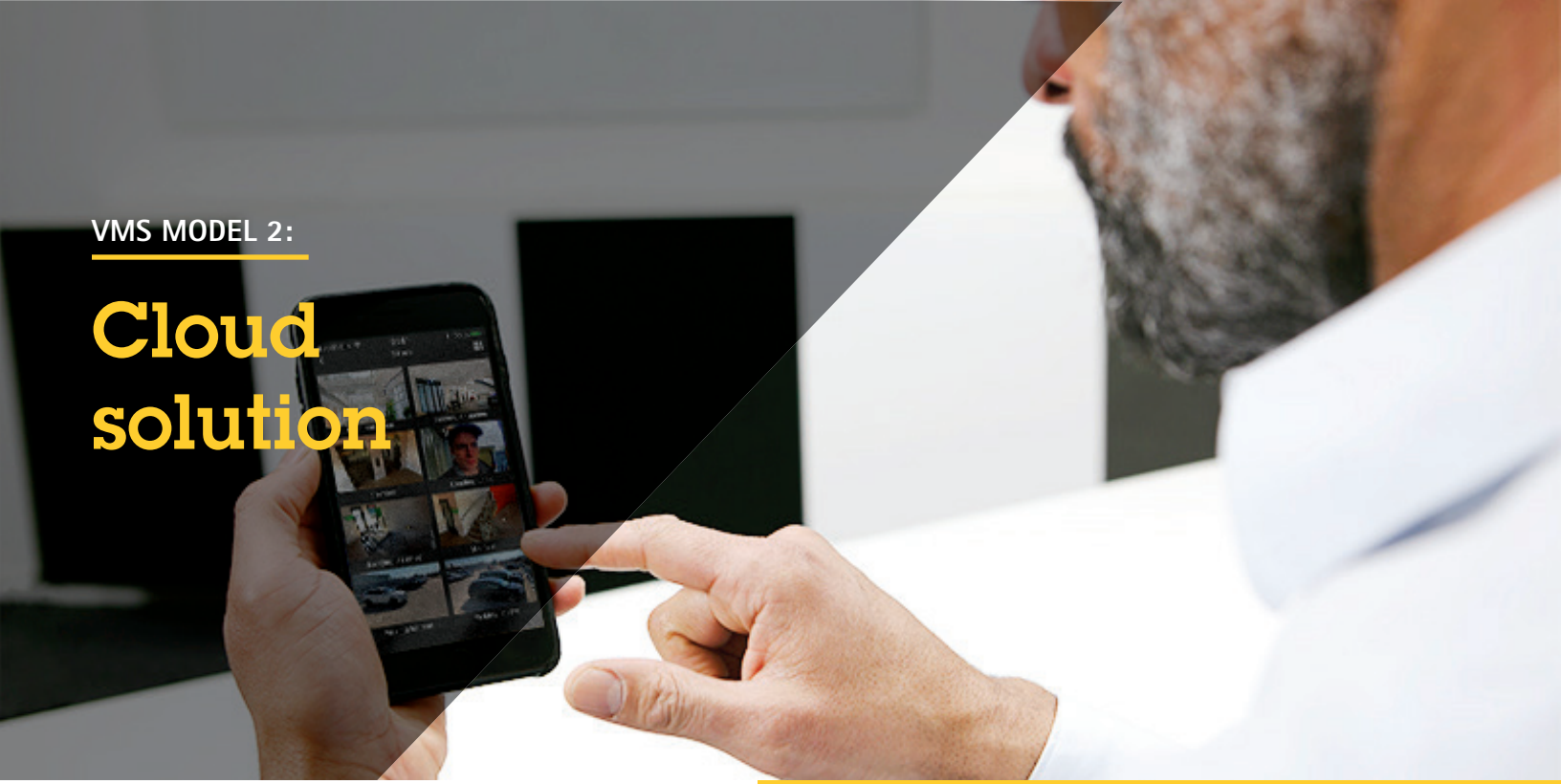
At-A-Glance

Advantages

- Easy access to video
- Control over system
- Retention time
- Lower long-term cost
- Ease of retrofit

Disadvantages

- Higher up-front cost
- Maintenance needs
- Use-case expensive



VMS MODEL 2:

Cloud solution

A cloud solution involves cameras and sensors connected to a cloud-based VMS. Rather than connecting to a server, cameras simply need to be connected to the nearest Power over Ethernet (PoE)-enabled network port. As a result, there is no need to host and maintain an on-site server or run extensive cabling throughout the premises.

Advantages

Lower up-front cost. A cloud-based VMS solution has significantly lower up-front costs than an on-premises solution. Servers and recording hardware are expensive, and turning to a cloud-based model means organizations do not need to invest in that hardware directly. It also means they do not need to dedicate rack space or construct and maintain a climate-controlled environment to house a server. More limited cabling also means installation costs can be lower.

Minimal maintenance. There is also minimal maintenance associated with a cloud solution. True, the organization still needs to keep cameras and sensors in working order, but server and VMS maintenance falls on the cloud provider and systems integrator, which reduces both the knowledge and financial investment. A cloud solution also lowers the necessary investment in cyber tools and IT personnel. It's still important to keep the devices themselves hardened and updated, but most cybersecurity requirements will fall on the cloud provider.

Access to stored video. A cloud solution can also improve access to stored video. The cloud makes remote monitoring easy—video stored in the cloud can be accessed from anywhere with an internet connection. This can be very helpful when it comes to monitoring rural and remote locations such as solar farms, oil rigs, radio towers, and other landmarks. It is neither feasible nor desirable to run cable throughout an entire oil rig, and constructing a climate-controlled room would be extremely difficult. Places like this, where it isn't reasonable to plug in a server or have a climate-controlled environment, are perfect for the cloud. They only require internet access.

Ease of relocation. While this is not universally true, cloud systems are often significantly easier to relocate. Cloud solutions are more "plug and play," and the minimal cabling required makes them easier to both install and remove.

Disadvantages

Potentially higher long-term cost. While the short-term cost is lower, the long-term cost of a cloud-based VMS can potentially be higher. A server is likely to be a fixed expense, whereas the cloud is an ongoing expenditure based on a subscription storage fee, usually per camera. As some point, those subscription fees will likely total more than on-premises storage. Even if an individual server is thousands of dollars, cloud storage fees will eventually eclipse it as surveillance needs grow. This isn't necessarily a problem, as that cost is spread out across a substantial length of time, but it is important to consider the financial model when making a decision.

Dependence on an Internet Service Provider. Unlike an on-premises solution, access to video stored in the cloud is dependent on an internet connection. That means that a service outage can prevent access to stored video and can also prevent video from uploading or syncing to the cloud. On top of this, organizations need to ensure that their ISP can provide the necessary bandwidth in addition to network reliability. Even with modern video compression solutions, uploading significant amounts of video to the cloud can be costly.

Lower retention times. On-premises servers can store footage for as long as the client needs it, but cloud plans often retain footage for only 30-90 days. Some providers offer longer-term storage options, but these usually come at the cost of video resolution. This can be a problem for those who may need to produce footage months after an incident has occurred.

Impact of defects and errors. If a hardware or software error disrupts the cloud syncing process, footage can be lost until the problem is identified and remediated. This differs from an on-premises solution, where footage is sent directly to the server in real time. While these types of errors are not common, they do increase the potential for lost footage, which should be taken into consideration when making a decision.

Who should be interested?

Those for whom on-premises solutions are not an option. Organizations managing remote or unmanned locations or locations where a climate-controlled server room is not feasible should look into cloud VMS solutions. Organizations in a location where extensive cabling is not feasible should also look into cloud options.

Those with multiple, smaller locations. It may not make sense for a business with a relatively small number of cameras across a handful of locations to build a server room at each location. Instead, a cloud VMS allows them to seamlessly manage all cameras from any location at a much more reasonable cost.

Those without extensive video retention needs. While cloud VMS solutions store video for less time, that may not be a problem for many organizations. Unless the user has a specific need for longer retention times, 30-90 days is usually enough.

Those who require mobility. Cloud solutions make it easy to pack up and move, which makes them ideal for construction crews, film productions, and other highly mobile operations. A cloud solution is easier to install and remove, so devices can be set up and dismantled as needed rather than as permanent or semi-permanent fixtures.

At-A-Glance

Advantages

- Lower up-front costs
- Minimal maintenance
- Access to data
- Ease of relocation

Disadvantages

- Higher long-term cost
- Dependence on ISP
- Lower retention time
- Impact of defects & errors

VMS MODEL 3:

Hybrid solution

A hybrid solution combines elements of both on-premises VMS solutions and cloud solutions. It adds a significant degree of flexibility depending on the specific needs of the customers, generally by combining a smaller server with additional cloud services. It's important to note that "hybrid" is used specifically in relation to servers, and not just any "on-premises" solution (such as a camera with a SD card).

Advantages

Lower up-front cost than a fully on-premises solution. An organization may want some degree of on-premises storage without incurring the cost associated with an expensive server. They may instead choose to invest in a server that serves as a backup, or that is used to store essential video that the organization needs to guarantee access to.

Peace of mind. A small server might be used to store 30 days of video on-premises, in addition to what is being sent to the cloud. This can provide peace of mind that the video can still be accessed, even in the event of a service outage. Organizations with unreliable internet service or with specific video retention needs may wish to avail themselves of this option simply for peace of mind.

Increased flexibility. In a hybrid model, users can decide how much footage to store on the server and how much to send to the cloud. They can play with the balance of on-premises and cloud storage until they find what works best for them, both in terms of video needs and financial impact. There are still long-term costs associated with cloud storage, but a hybrid model adds a degree of flexibility to help manage and mitigate that ongoing expense.

Disadvantages

Up-front costs remain. Even a small server requires a significant initial investment, as well as a climate-controlled environment. That means the organization still needs to dedicate both energy and space for server maintenance, and also take steps to ensure the security of the environment. Furthermore, the use of some hardwired devices will still require some degree of cabling.

Maintenance is still a factor. Hardwired devices require cabling, and those devices also need to be maintained and updated regularly. Running an on-premises VMS requires technical knowledge and may require additional IT personnel or third-party investments. Cybersecurity is still a significant issue with a VMS running on-premises, and the organization cannot rely solely on the cloud provider to keep the system secure. That said, the costs will still be lower than those associated with a fully on-premises solution.

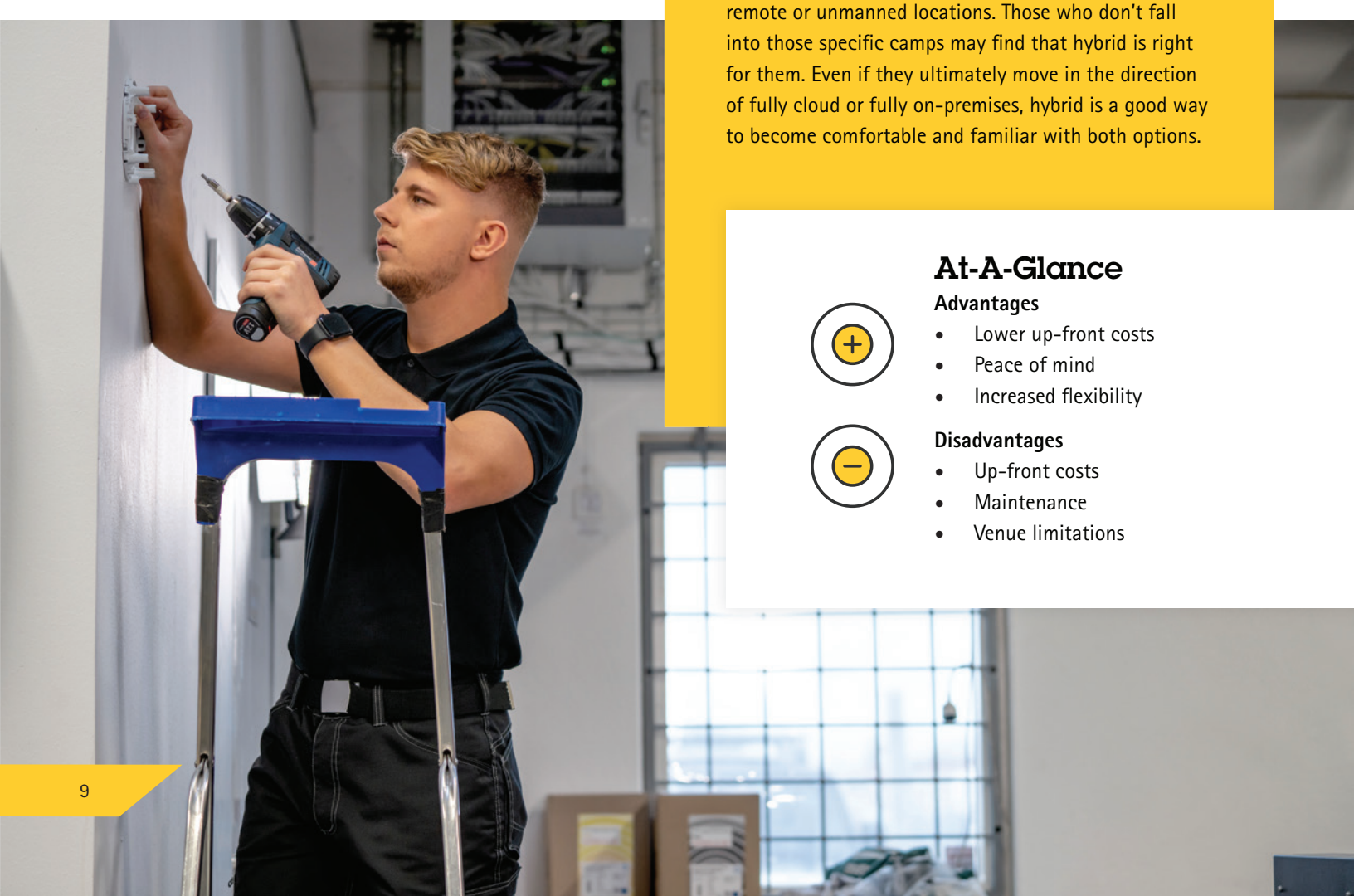
Venue limitations. Like an on-premises solution, a hybrid solution will not be feasible at a location that cannot house a server room, or where running cable is not possible. As with on-premises, businesses with multiple smaller locations may also not find a hybrid solution efficient. While hybrid does provide certain advantages, it remains heavily use case-dependent.

Who Should Be Interested?

Those looking to transition from on-premises to cloud, or vice versa. A hybrid setup makes transitioning in one direction or the other much easier, serving as a transitional step that allows the organization to make the change gradually and avoid downtime. It allows businesses in transition to keep a small server in play until they are confident in their cloud provider (or vice versa). However, some organizations that intend to use the hybrid model as a stepping stone find that it works better for them than either fully on-premises or fully cloud.

Those who aren't sure whether on-premises or cloud is right for them. Hybrid solutions have a "best of both worlds" quality. That doesn't mean hybrid is right for everyone, but it does highlight the best qualities of each option. This can help users better understand the advantages/disadvantages of both cloud and on-premises solutions without fully committing to either one.

Those who don't have specific needs associated with on-premises or cloud. An on-premises solution is great for those who require 24/7 uptime, face specific regulations, or have an incentive to store video for longer periods of time. Cloud is great for those who need to be flexible, can't accommodate a server room, or need to secure remote or unmanned locations. Those who don't fall into those specific camps may find that hybrid is right for them. Even if they ultimately move in the direction of fully cloud or fully on-premises, hybrid is a good way to become comfortable and familiar with both options.



At-A-Glance

Advantages

- Lower up-front costs
- Peace of mind
- Increased flexibility

Disadvantages

- Up-front costs
- Maintenance
- Venue limitations

Final Considerations

When it comes to choosing a video management system (VMS), research is critical. There is no "right" VMS decision—which option is right for an organization depends on their specific needs. It's important to research factors like total cost of ownership, reliability of systems and devices, cost to maintain or add to the system, and how easy it is to change or break from the system once installed. All of these factors will vary based on the number of locations, number of devices in use, video retention length, specific device manufacturers, and other considerations.

This is why it is important for organizations to find high-quality technology partners—and that isn't just limited to device manufacturers and VMS providers. A good systems integrator can be every bit as important, and it's essential for organizations to find a partner who can help maintain the entire system, whether it is based on-premises or in the cloud. Remember, the lifecycle of the system is just as important as the initial installation.

Ultimately, whether a system is successful depends entirely on how well it meets the user's individual needs—which is why it's important for today's organizations to carefully consider those needs before deciding which VMS option is right for them.

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