

Centralized Knowledge Management

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1 Introduction

In 2012, the Information Technology (IT) department of the organization in which I worked decided to “portalize” its data. This meant that files previously stored on shared drives, email accounts, and individual computers would be centrally stored on a web-based “portal.” The technology that we used was Microsoft SharePoint.

The project was not initially popular. SharePoint had a bad reputation for being slow, inefficient, and difficult to use.

Over time, we realized that SharePoint was actually quite fast, efficient, and easy — when used effectively. Many knowledge workers today are comfortable and familiar with Microsoft Office (especially Outlook, Excel, PowerPoint, and Word). These programs are as powerful as they are popular. Using a portal does not mean that we need to abandon these tools, but a successful “portalization” project requires us to recognize where Microsoft Office programs are appropriate and where they are not.

In this white paper I will describe the many benefits the portal brought to our organization. I will also discuss some specific steps I recommend to usher a successful institutional change. There are many *knowledge management* (KM) technologies competing with SharePoint. My intent is not to “shill” for Microsoft. My goal is to persuade knowledge workers to centralize their information and stop abusing Microsoft Office documents, shared drives, and email.

2 Benefits

2.1 Centralized Knowledge, or the “One Document of Truth”

It’s 9am. The big briefing is at 10am. Everyone was supposed to have their section’s slides to operations yesterday at 4pm. The finance slides were submitted on-time, with uninspiring but accurate data. IT submitted the same, unchanging network map we see every week at the stand-up yesterday, but sent two minor updates this morning. Logistics over-delivered, producing 20 slides of colorful data tables with hundreds of numeric details in an illegibly small font. Security did not submit anything. Operations intended everyone use version 3 of the new template, but the email with the template is still in a Drafts folder.

Does this sound familiar? This might sound plausible for any organization. It does not have to be this way.

Older versions of SharePoint provided a *slide library*, which outright solves most of these problems. The slide library contained a separate item for each slide. Each slide can be edited independently. Selected slides are concatenated into a presentation with the click of a button.

Microsoft’s documentation (<https://support.office.com/en-us/article/use-slide-libraries-to-share-and-reuse-powerpoint-slides-c419e77f-8a94-4fc1-a7f0-f5e6cdd7e419>) says that the slide library itself is now deprecated. If the slide library has been replaced with something even better, great. My point is that the slide library gave my organization the ability to collaboratively author a document. Exactly one copy (the current version) of the document existed. There was no need to manually merge information gathered through email. Everyone knew where to find it. My supervisor coined the apt term “one document of truth” to refer to these properties.

PowerPoint slideshows are, of course, not the only information that benefits from centralization. Another common task in large organizations is to produce, maintain, and disseminate a telephone directory. An

ineffective approach to this simple problem is to gather information in Microsoft Office documents over email. A superior solution is to create a telephone directory on SharePoint using a *contacts list*. The contacts list is a built-in table with predefined fields for the surname, given name, telephone number, email address, office, etc. Additional fields can be added if necessary. The content of any SharePoint list can be made available to the built-in search engine.

Everyone in the organization benefits from a centralized contacts list, such as <https://www.example.com/Contacts/>. This would be a good example of a “document of truth.” In this example, the organization should ordain the contact list as the official company telephone directory. Furthermore, the company should mandate that the contact list be regularly updated to reflect new hires, office moves, promotions, name changes, etc. Precisely *who* updates the contact list, how frequently, and how quickly is a matter of *information governance*.

2.2 Network and Storage Efficiency

A minor advantage of centralizing information on SharePoint is that it spares our mailboxes. This is not a concern for Gmail users on 4G/LTE. Those of us with small mailboxes or slow network connections should favor links to documents uploaded to a portal over attachments.

In many organizations, managers will disseminate data, reports, policies, and other documents by email. This is a **bad** idea. Distributing documents by email limits the useful lifetime of the document. Employees will generally either read the document immediately or forget about it. New hires, who were not on the original “To:” line, may never find the document. In a negative case, the effort required to produce a document might be repeated.

Instead of attaching the document to an email, upload the document to a document library and insert a link to the document in the email body.

2.3 Concurrency

The next major benefit of using SharePoint is that it allows users to simultaneously modify elements of a data structure. For example, in the previous section I proposed an organizational contacts list. SharePoint imposes no restriction on two different managers inserting new contacts into the list at once. There are problems if, for example, two users simultaneously edit or delete an item. SharePoint does not place *locks* to guarantee exclusive access to a list.

Suppose our hypothetical organization builds an asset database at <https://www.example.com/Logistics/Property/>. To my knowledge, SharePoint has no “canned” template for equipment inventory. This is not a problem. SharePoint provides *custom lists*, which may be used to define a table with arbitrary columns.

Logisticians can individually create, modify, and remove items from the property book at once. This is in contrast to storing this information in an spreadsheet. Microsoft Excel locks an open file to prevent simultaneous access.

Concurrent write access to a SharePoint list is enabled by an assumption: the database schema (structure) is stable. This is an area where Excel has an advantage. When only one person can write to the database, there is no restriction on adding or removing columns. For this reason, SharePoint lists are most effective when the structure of the table is stable. Excel spreadsheets are useful for quick, individually-authored, short-lived documents. SharePoint lists are generally superior when the information requires either multiple-authorship or longevity.

2.4 Versioning and Backups

SharePoint *can* be used as a file server. This should not be the primary use for SharePoint. File access in a SharePoint *document library* is generally slower and less convenient than a traditional shared drive. However, there are a few advantages of using SharePoint’s document libraries over shared drives.

Suppose our hypothetical organization’s operations staff keeps its reports in a document library at <https://www.example.com/Operations/Reports/>. These reports are usually authored by a single person using Microsoft Word. A useful feature, available in all SharePoint lists, is *versioning*. Any item in any list can

keep major and minor version numbers. The site administrator can restrict how many revisions to retain. This feature can be used to easily recover older versions of list items and documents.

SharePoint also contains a recycle bin to capture deleted items before permanently removing them.

In my own experience, our server team went to the extraordinary measure of copying the complete portal each night to a testing and backup virtual machine. This one-way copy gave the programmers a safe environment to experiment with changes to the web site. It also gave the organization another option to recover data on those rare occasions that the recycle bin was not useful.

Data retention is, in general, a solved problem. Shared drives today have a “restore previous versions” feature that allows users to recover older versions of their own data. Nonetheless, it is worth noting that SharePoint’s data retention and recovery features are built-in, easy to use, and mature.

2.5 Organization, Search, and Curation

My organization in 2012 had a strange “four clicks” goal. The idea was that anyone should be able to find the information they needed in no more than four clicks from the homepage. Suppose a manager wanted to check the daily leave tracker. An intuitive path to this information might be Home → Personnel → Reports → Leave (three clicks).

As obvious as this sounds, consider that this is not at all how shared drives are organized in many organizations. Large organizations hide information in long and bizarre paths, such as `Z:\Organization\Company\Section\Staff_Folders\Personnel_and_Finance\Public\Daily_Reports_(new)\2019\Leave_Tracker\`. This example might seem silly, but in my anecdotal experience it is fairly realistic.

Share drives are notoriously difficult to search. Searches can be slow and might be only able to consider the file names. If someone needs the information in `2018.xlsx`, they may never find it. SharePoint lists can be configured to advertise or conceal information from the search engine.

Web pages are a very useful method to curate information. A useful home page should provide contact information and links to documents, libraries, and databases of particular interest. Ideally, all pages should also indicate the person or office responsible for that page. The responsible party should be receptive to corrections, updates, fixing broken links, and removing pages or documents that are no longer needed.

Generally speaking, SharePoint sites are easier to search, organize, and maintain than shared drives. Again, this comes down to information governance. Who owns the information? The consensus on this subject from IT departments is that though IT *manages* the information technology, the *knowledge* belongs to the organization’s senior leadership.

2.6 Access Control

I do not know that SharePoint’s access control policies are any better than the New Technology File System (NTFS) permission model. SharePoint might be slightly simpler and easier to configure.

In either case, organizations *should* be deliberate and cautious when developing access control policies and solutions. Organizations should consider not only named confidentiality levels but also special requirements. Special protections are given to attorneys, clergy, healthcare providers and protected health information (PHI), payment card information, contracting, personally identifiable information (PII), evaluations, and personnel actions.

Access control should be an important consideration in any knowledge management strategy. Any technical solution must satisfy the organization’s regulatory requirements and acceptance of risk. Ideally, a solution should be easy to configure and maintain, testable, auditable.

2.7 Notifications

A minor but useful feature that I learned to like in SharePoint was its *alerts*. Any user can configure an alert for any list, library, folder, file, or list item that they have access to read. Users can specify the frequency for these alerts.

As an example, our operations staff kept a log on our SharePoint site. The log consisted only of a title and text field, where anyone could create an item that contained a few lines of text. These items might

contain anything the watch found important enough to pass on to the next shift, ranging from record of a telephone call to the death of an employee.

I configured an alert for this list to email me a daily report of all changes that had occurred that day. I found this a useful way to keep abreast of current events in the organization.

Years later, at a different organization, I configured a weekly alert on a document library. This way, anytime someone modified, created, or deleted an item I would be able to see what had changed during the week.

3 Organizational Change

Organizational change can be difficult. It is especially difficult when employees are frozen in their habits. Here are a few recommendations to make the transition easier.

3.1 Technical Training

Employees will never fully embrace a technology they do not understand. Create a “sandbox” for SharePoint training and have each employee create sites, lists, libraries, and pages. Show them where the information they need is and how to use any custom features. Explain the rules and expectations for where and how knowledge is to be stored and shared. Integrate this training into newcomers orientation classes.

3.2 Think Rows, and Convert Spreadsheets to Custom Lists

A “low hanging fruit” to get organizations excited about SharePoint is to convert their most-used data structures to custom lists. This data structure might be an Excel spreadsheet, a PowerPoint slide, or even long reports. All of these information assets can be represented as a custom list.

A spreadsheet is particularly well-suited to conversion to a custom list. Consider travel expenses. The finance section might require a standardized Excel spreadsheet that looks something like this:

Name		John Doe
Start Date		November 1, 2019
End Date		2019/11/05
Travel Auth No.		VpKUvS
Day	Description	Price (\$)
1	Airfare	233.65
1	Hotel	95.20
2	Taxi	11,68 €
2	Hotel	95.20
3	Airfare	205.11

This form is poorly structured for use in a database. To use a list effectively, all of the information should be representable as *rows*. One way to do this is to simply list certain elements more than once.

Name	Date	Travel Auth No.	Description	Price (\$)
John Doe	11/05/2019	VpKUvS	Airfare	233.65
John Doe	11/05/2019	VpKUvS	Hotel	95.20
John Doe	11/06/2019	VpKUvS	Taxi	11.68
John Doe	11/06/2019	VpKUvS	Hotel	
John Doe	11/07/2019	VpKUvS	Airfare	205.11

Ideally, the Name field not be a string of letters, but rather a reference to John Doe’s user account. Furthermore, the travel authorization number *should* be a *lookup column* that links travel expenses to another list containing travel authorization data (much like a *foreign key* in a relational database).

Whoops, it looks like our example table did not accept input containing a non-numeric symbol (€). This is an example of the considerations that must be made as a database matures. Perhaps John Doe should have converted this expense to USD. Perhaps an additional column should be added to allow users to specify currency.

Data in rows is easy to analyze. What is the total travel monthly expense cost over the past six months? This can be easily shown by creating custom views for the list. Interested if traveling on a specific day of the week makes a difference on airfare? Not quite as easy, but we work on it. Want to compute Z-scores from the standard deviation on total travel costs by traveler? Yikes, that kind of statistical analysis might not be possible in SharePoint natively. Fortunately, all of the data in a list can be exported to Excel and other formats with the click of a button.

3.3 Score an Early and Easy Win

I mentioned slide libraries at the beginning of this paper. This was a very useful and popular feature, as our organization used PowerPoint extensively. Learning to use the slide library was an early and easy win for us to transition to SharePoint. Think about the most painful business processes your organization has on its computers and see if you can solve this problem with better information governance.

3.4 Develop and Enforce Information Governance Policies and Procedures

Information technology is just a tool for computation and communication. Technology should enable businesses to perform their core functions efficiently and effectively. The knowledge of an organization does not belong to the custodians of the machines; rather, it belongs to the leaders at the helm. Just as senior leaders set policies and priorities for operations, budget, and personnel, so too much senior leadership be directly involved in organizing, curating, and safeguarding information. After all...your employees are spending 90% of their day on the computer anyways.