Up into the cloud

How online databases beat Excel in business

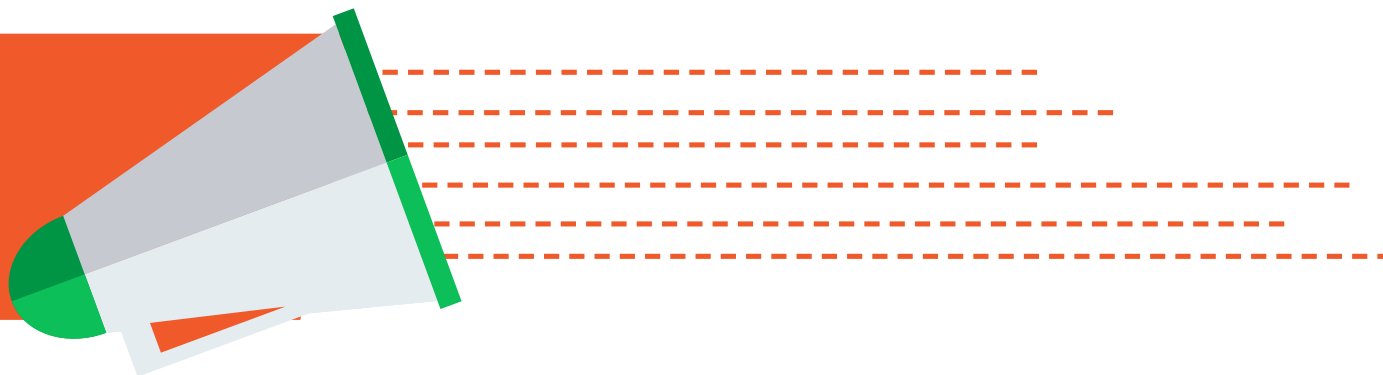# Index

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Introduction

When it was released in the late 1980s, Microsoft Excel took the world by storm. At that time, computers were becoming more and more prevalent in everyday life, and businesses were rapidly moving away from paper-based record-keeping. Spreadsheets were a welcome development in software and businesses quickly adopted the technology, centralizing data and performing arithmetic calculations much faster, giving their productivity a major boost.

A lot, however, has changed in 30 years. There have been huge advances in business models, performance metrics, processes, and workforce. And though spreadsheets have held their place through the changes, they aren't made for dealing with all the real-world challenges, today's business scenarios throw at them.

With over-reliance on spreadsheets putting productivity at stake, businesses today are increasingly moving to databases. And there's no lack of options available, from on-premise to online, from niche solutions to comprehensive ERPs. Before we look at what sets Zoho Creator apart from the competition, let's examine how an archetypical database can take your business to the next level.

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But, what do databases offer that spreadsheets don't?

That's exactly what this ebook is about—how databases can be superior to spreadsheets in some situations. We'll be introducing you to a fictional business owner and taking you through his struggles with spreadsheets, while explaining how he could have benefitted from using a database instead.

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Spreadsheet vs Database:
A business owner's predicament

Meet Bob.

Bob set up a tiny DIY hardware shop, Hands On near his home in Anytown, Texas. Before he spotted the gap in the market, there was no hardware store in the area around Anytown, and within a few months people were flocking from neighboring towns to visit Hands On.

By the end of the first year, Bob's business was thriving, so naturally, he started thinking about expansion

After a year, he set up shop in another area of the same town, and then another in the neighboring town. Soon, he struck up partnerships and opened stores in four more towns across the state. What started as tiny venture ballooned into a thriving business, with a customer base that grew week on week.

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What tool does Bob use to manage his processes?

Bob, though an astute businessman who knows his trade, is not very tech savvy. When he started out, he ran his business entirely on paper. He maintained his product inventory, supplier details, and sales accounts in a big fat ledger. Then came the next store, and a second ledger. With the third store, Bob knew he needed a better tool.
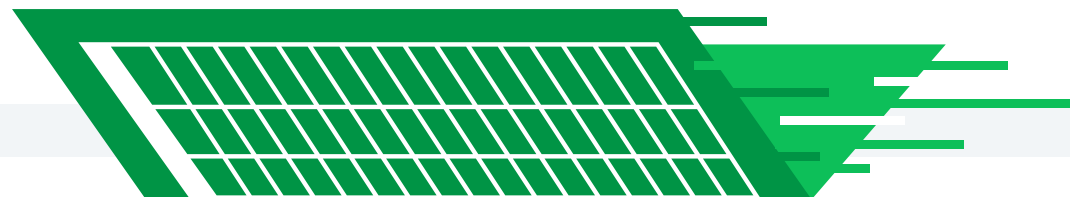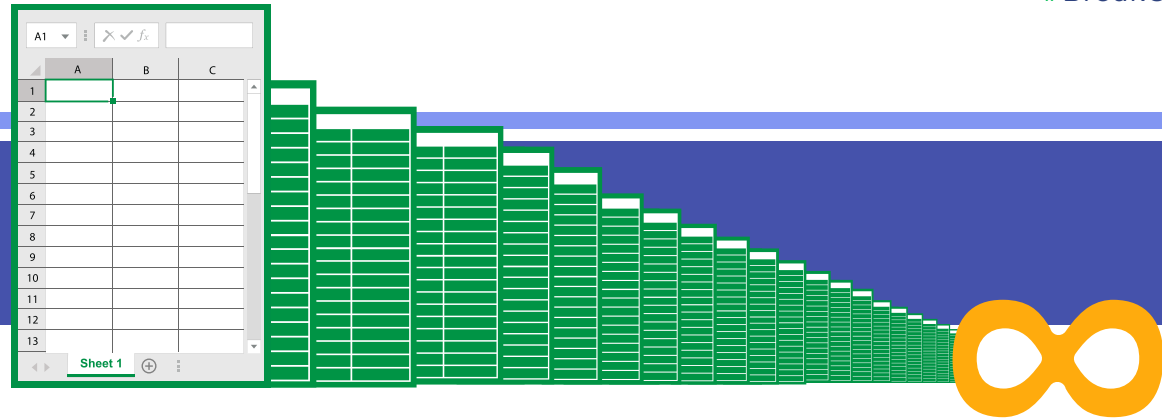
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Enter Excel.

Bob chose Excel for his business because that's what looked the easiest. He moved all of his data: customer details, product inventory and pricing, customer orders, supplier and purchasing details, daily accounts etc. to spreadsheets. And it worked because:

- He was able to clear his desk of the huge ledgers
- All his data was in one place
- He got the hang of Excel quite easily, without having to spend much time learning it

But not everything was perfect.

Not all problems could be swept under the sheet...as Bob discovered soon enough.

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What went wrong?

A lot, actually. As Bob's stores expanded he discovered that the spreadsheet,

which had been so helpful when he started out, was now causing a number of problems.

As his business grew, so did his sheets

When Bob first transferred data from the ledgers, he had just two workbooks, one for each

store. Each workbook had a worksheet for product and supplier details, daily accounts,

and details of customers. But when Bob's business grew, the number of sheets he needed

grew tooand so did the problems with using them.

Here, we join Bob as he navigates the obstacle course of spreadsheets, in which he must

leap over mistaken entries and dodge miscalculations.

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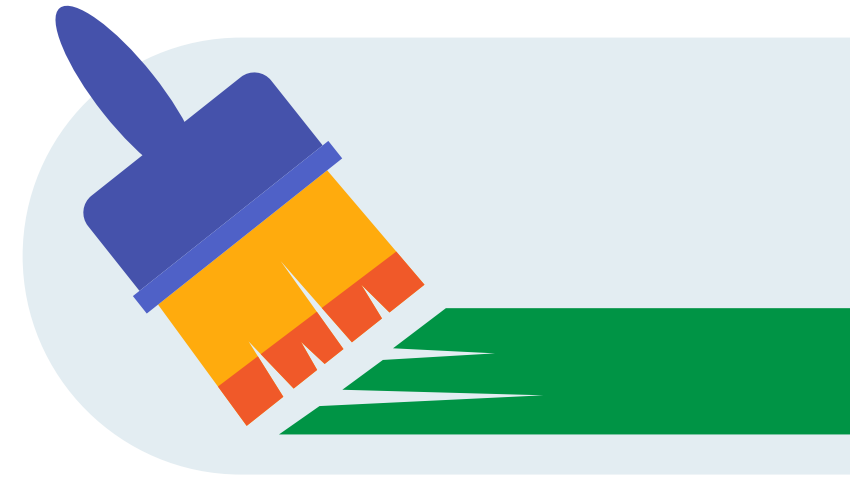|	A	B	C
1	Product	Quantity	Cost
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3	Table (small)	403	4000
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5	table lamp	167	1000
6	Dining Table		9800
7	sofa (5 s		15000
8	Tab ge)		500
9	T		
10	chair (l		4500
11	table lamp		3600
12	bed (single)		11000
13	sofa (5 seater)		18000

Obstacle #1 Unwieldy data

Every time Bob opened his workbook, he was confronted by rows and rows of cells of data - certainly not what he wants to be greeted by first thing in the morning. He had to spend a significant amount of time making sense of his sheet before he could start entering more data. This only grew worse as more business meant more data, and he found himself overwhelmed.

And that was just his workbook. Every day, Bob's storemanagers, partners, and suppliers shared workbooks with him, each using their own style of data representation. Bob had to spend a large part of his workday decoding them, time he could have otherwise spent strategizing or working more directly on making profit.

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The Problem:
An endless array of cells

The interface of spreadsheets, a sea of cells, doesn't make for a very user-friendly experience. As the volume of data grows, it is increasingly difficult to read, making matters difficult for anyone trying to use the sheets. And this only gets worse when non-numerical (textual) data is included.
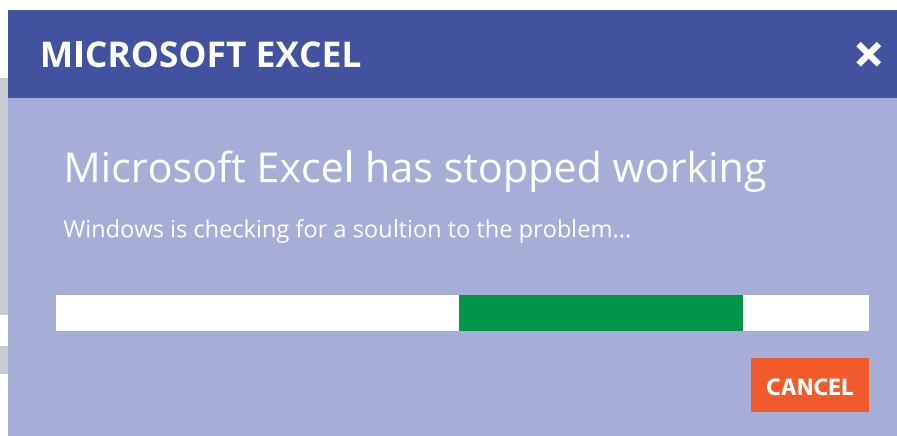
"The cell-centered design of spreadsheets makes entering and reading textual data like long names, addresses, and notes messy."

Often, the cell format is disrupted when this type of data is entered, impacting the display of neighboring cells. This drastically reduces readability, and users have to spend a non-trivial amount of time formatting and aligning the cells to make the sheets readable.

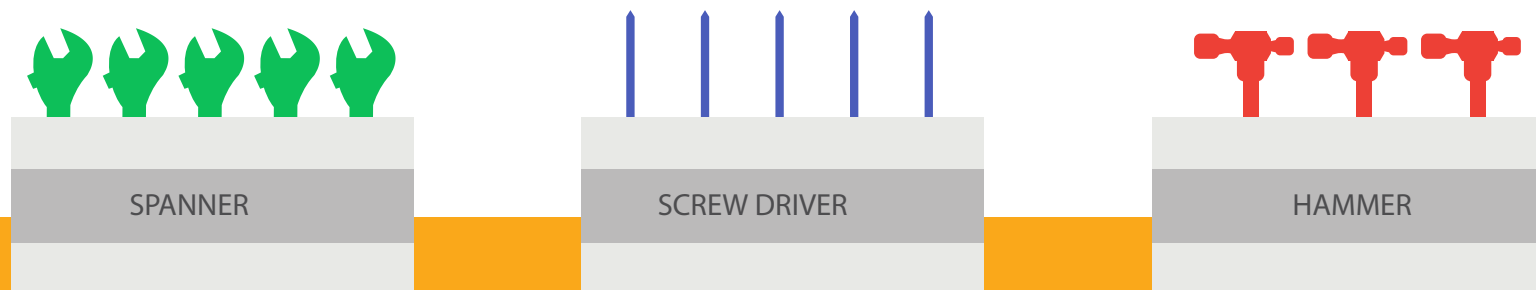ZOHO Creator

Data overload?
Sorry, I'm shutting down.

With more business came more data, and Bob&co, with implicit trust in their spreadsheets, kept feeding them with data. And one fine day, the spreadsheets decided they'd had enough. They refused to accept any more data, and when Bob attempted one more entry, they went under and crashed. And they took all the data down with them. Since the crash was unexpected, Bob hadn't any time to save the sheet, so all he could do was gawk at the message.

MICROSOFT EXCEL   ✖

Microsoft Excel has stopped working

Windows is checking for a soultion to the problem...

CANCEL

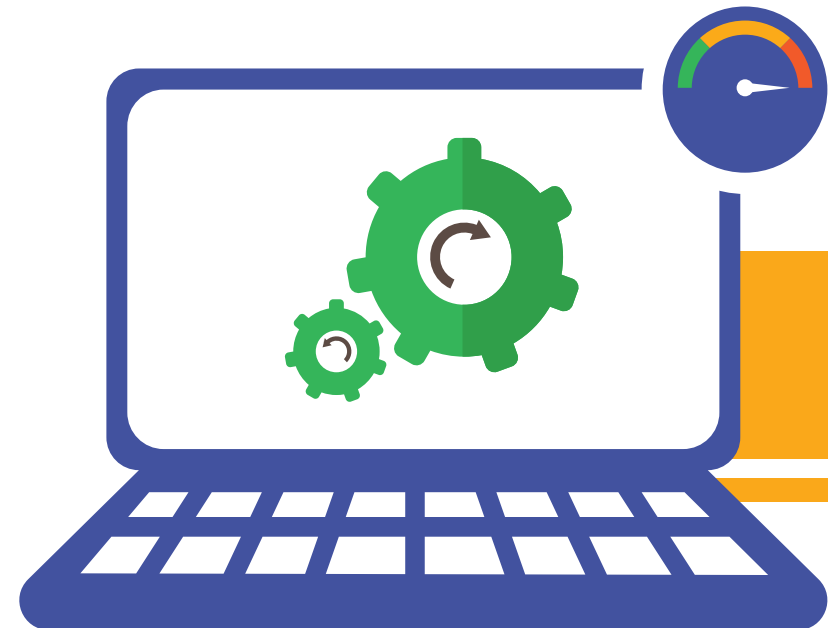ZOHO Creator

The Answer: Fastidious rules for structure

Databases allow for the use of forms for data entry, so in most cases, the first thing you encounter
 when you open a database is a clear, streamlined form. As well as being pleasant to the eye,
forms help structure data and make it easily readable for both humans and machines.

Structured data is infinitely easier to operate on. Operations can range from a simple search and sort
to complicated automation. Structure gives you more control over your data; imagine you them out on
the floor where they can easily roll away, or splitting them into boxes where they're safely contained?
And wouldn't it be easier for you to sort them in separate sets (boxes),
rather than in a big heap?

SPANNER

SCREW DRIVER

HAMMER

ZOHO Creator

Crash? What's that?

Databases, which keep their data structured, are immune to crashes. Data is stored in atomic tables, each of which is treated as a separate entity. So even if a database is confronted with a load 100 times more than the normal, it can handle it just as smoothly as if it were the usual load. The probability of data being lost to crashes in a database, especially an online one, is NULL.
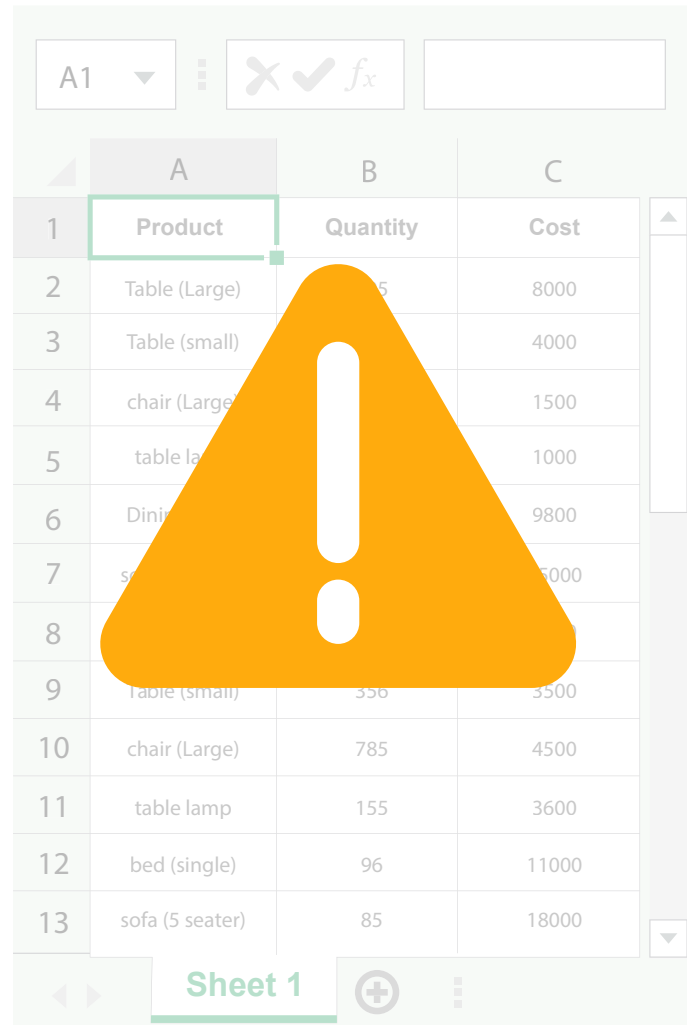
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Obstacle #2
Data entry is disorganized, and validation inadequate

When Bob started out, he managed his sheets all on his own. His product offerings were limited, and he entered their details in a way that made sense to him: for example, while storing product details, he entered the names for some products, and serial numbers for others. As his product line grew, he found that he was barely able to understand his product list. That's when he realized the need to follow some sort of system in entering data.

What about the data he'd already entered? Bob had to spend days re-entering the product details in an orderly manner. This of course, was no easy task, and caused him a lot of stress.

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The Problem: Again, cells

The UI of a spreadsheet is extremely simple and user friendly; it's almost like paper on your screen. You can start entering data just as on paper, without having to set or define rules for entry. As there are no rules, any kind of data can be entered into any cell, however incongruous it is with the other data in a particular row or column. However, as the amount of data grows, this very advantage poses serious risks.

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The Answer: Forms

Most databases employ forms, and you must first define field types before you start data entry. This task might seem cumbersome initially, but pays off in the long run. Defining fields types provides structure to data, which not only makes it easier to read, but also helps in establishing complex data relationships.

Now, if Bob uses databases, he will have to define the field types before data entry; in this case, product names and IDs would be separate fields. So if Bob tries to enter ID numbers in the name field, he would get an "invalid data" alert. This will prevent confusion caused by inconsistent data entry, which often happens with spreadsheets.
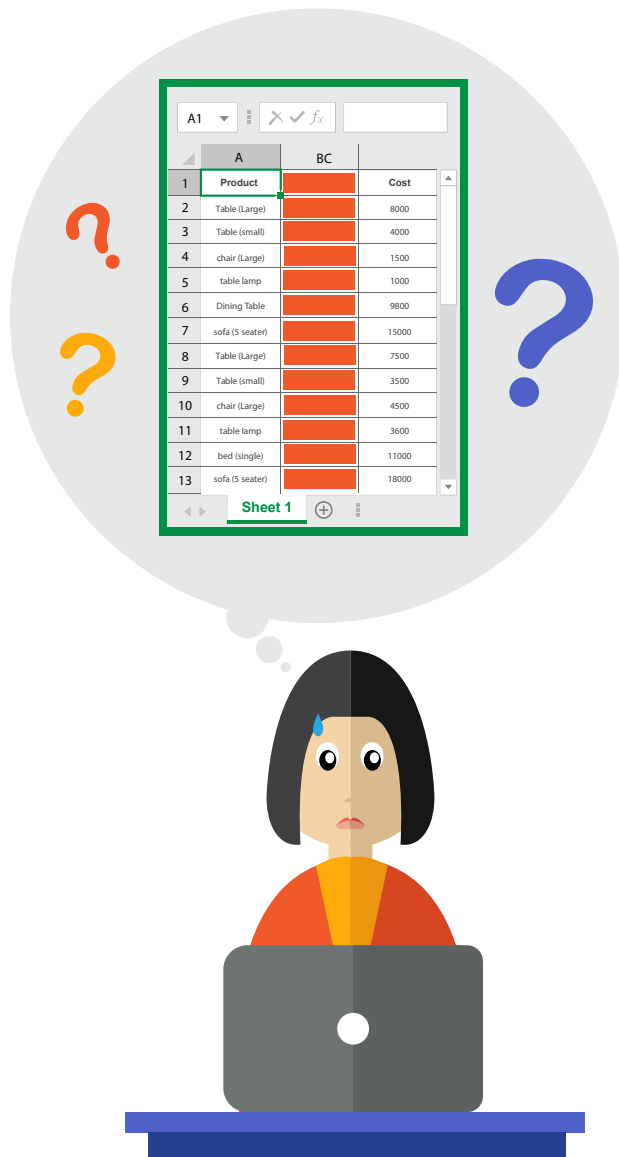
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Obstacle #3
Version control is a mystery

Carla is one of Bob's sales managers. Every month, the store managers in her region send her individual sales reports for that month. She consolidates those reports into a single report showing the overall regional sales, and sends it to Bob.

She would often accidentally delete a column containing the sales for a particular product. Not realizing her mistake, she would continue consolidating the data, and only when the final report showed massive variation from the previous ones would she realize something was amiss. It was very difficult to work out exactly when the mistake was made, so she could never figure out exactly what data had been lost. She had to go back over all the source workbooks and compare them to her sheet, find the missing data, copy it to her master workbook, and begin the consolidation process again.

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The Problem: No way to check old data

While Excel does have a "restore to last opened" option, it isn't a very useful feature, for the reasons listed below:

- It doesn't work unless the sheet is saved after every change. In the event of an inadvertent closure due to a power outage, all changes made to the sheet since it was last saved are irrevocably lost. (Excel does have an AutoRecovery feature that automatically saves files every 10 minutes or so, but finding that unnamed file from an unknown destination could be unnerving).

- Even if saved, only numbers can be retrieved. Components like formulae, charts, and macros are lost.

- Recovering data from a corrupted file is extremely complex. First the file has to be repaired, and only then can the data be retrieved. The built-in recovery options are usually inadequate, and more often than not it's necessary to employ third-party recovery tools.
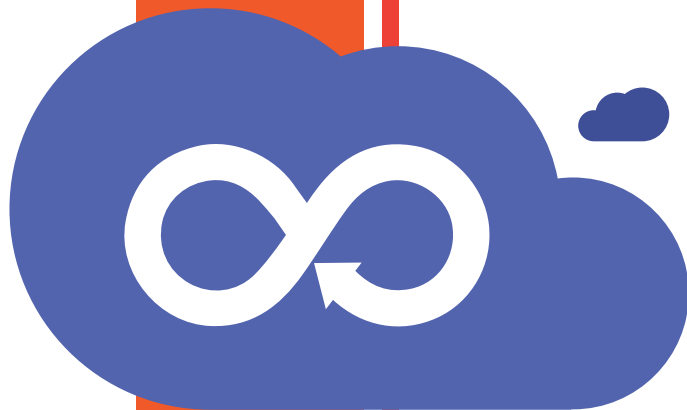
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The Answer: Infinite back-ups in the cloud

Version control problems in Excel arise because the files are available only offline. Online databases routinely back up applications and store the versions on the cloud. So if you change or delete any data by mistake, you can always go back to previous versions and restore the version which works best for you.

Version control is crucial when sharing data. The more people are working on a file, the more important it is that the original or source data remains untouched. If the owner accidentally shares the original workbook and merges the changes made by the recipients, the source data is distorted beyond recognition.

With online databases, every change made is stored as a version. So you can easily track changes or restore the original data whenever you want.

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Obstacle #4
Too many rifts in data relationships

Bob had orders pouring in each day and was struggling to keep up with them. Or rather, his spreadsheets had a tough time keeping up. More often than not, he found himself juggling dozens of sheets to link customers with the products they ordered.

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The Problem: One-dimensional structure of spreadsheets

This is largely due to the one-dimensional structure of spreadsheets. Data is stored on a flat screen with no scope for compartmentalization. The lack of multi-dimensionality makes creating relationships between data difficult.

So, if Bob creates an orders sheet, he has to copy and paste all the customer names from the customer detailssheet and the products they order from the product detail sheets, into the new sheet. While this is a simple, if time-consuming, task, the real trouble starts when more elaborate transactions are involved, like when one customer places more than one order, or when one product is ordered by more than one customer.

In this example, the primary entity (the customer names) must be copied as many times as the number of products they've ordered. Since all customer details (name, address, email, etc.) are stored on the same sheet, the user must carefully select and copy only the data they need (e.g. names). This results in the same data and action (copy and paste) performed countless times, increasing the risk of duplicate data and manual errors, and much slower processing times.

One tool that Excel offers to avoid all the copying and pasting is Vlookup. While Vlookup makes fetching data from other sheets easier, it doesn't completely eliminate the risk of duplication and errors.
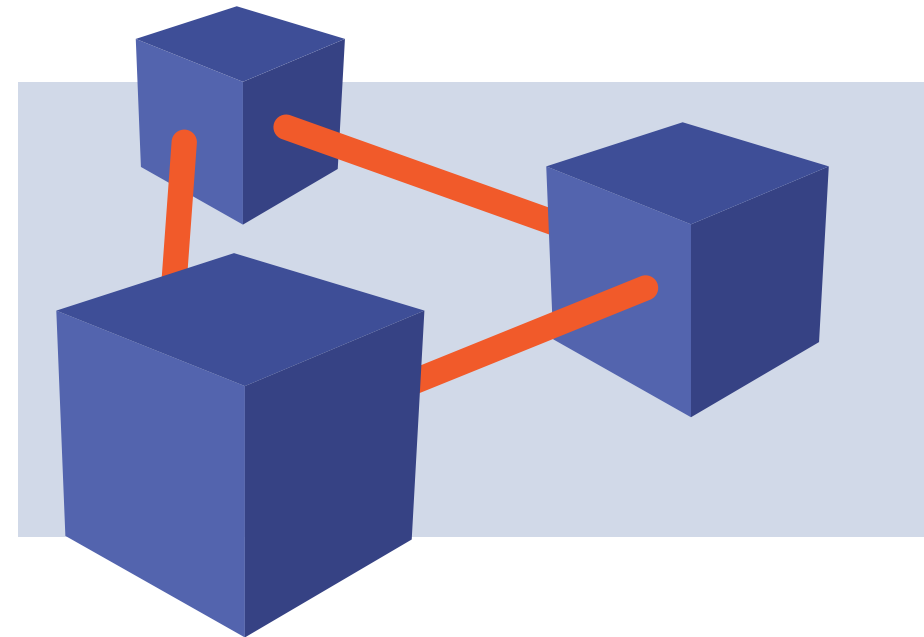
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Here are some restrictions in using Vlookup:

- When performing a look-up between two sheets, one of the columns in the sheet the values are looked up in must be the key or reference column, and the same column must be present on the other sheet. Deciding the key column is up to the user, and if not done right, can cause serious, far-reaching problems.

- The formula is stored in just one cell of the column. The cell must be dragged down to make it work for the rest of the cells of the column. Cells could be missed, and if the column being looked up lacks a value or if non-absolute values are used, the cell corresponding to that value shows an #N/A.

- Sometimes, more than one column is needed in performing a lookup. Vlookup, however, permits only one primary key column. The only available workaround for this is to set up a column that combines the required columns for use in the Vlookup, which is highly complicated and error-prone.

- The column labeled as the key should always be on the left of the columns whose values are to be returned. Otherwise, Vlookup will not work.

- Vlookup requires all sheet names, boundaries, column numbers, etc., to be defined, and any error can cause issues which affect all connected sheets.

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The inability to automatically update changes across sheets is another drawback of lack of relationships. For example, if a certain product has been replaced, the new product must be manually updated in every sheet where it appears. For complex and extensive operations involving hundreds of sheets, this could be a huge undertaking.

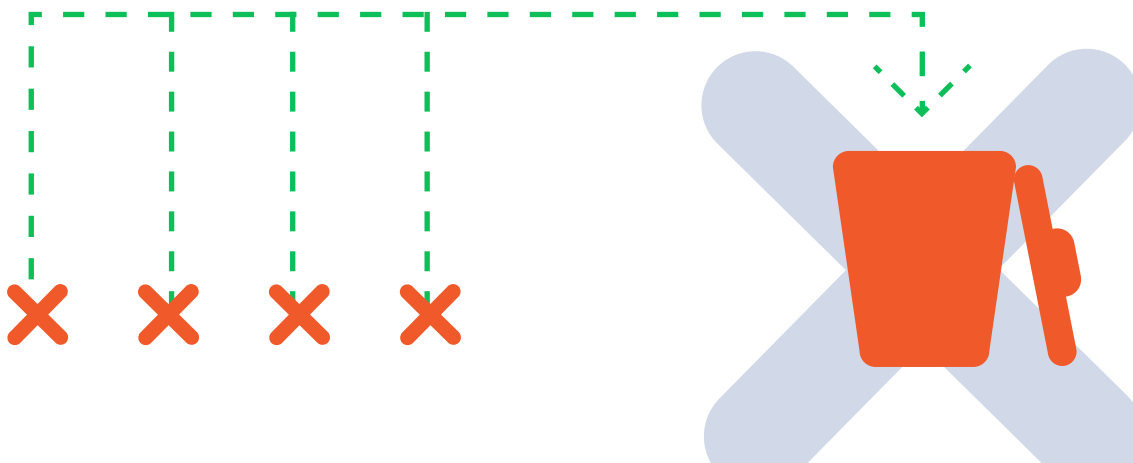## The Answer: Multi-dimensional structure

Databases use relational architecture, where data is stored in normalized tables rather than in one long sheet. Normalized data is data in its atomic form, which cannot be divided further. So in Bob's scenario, if a customer places more than one order, each order associated with the customer will be stored separately.

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How does this help in data relationships?

Imagine a customer buys two products, a step-ladder and a coffee table building set. They return the coffee table set after about a week. Now, if a spreadsheet is used for tracking, both products would be logged against the customer's name at the time of billing and used in the daily and weekly sales reports. If the customer returns a product, it must be removed manually from every report it appears, and all calculations have to be redone.

With a database, when a product is removed from one report, it is automatically removed from every related report, and the results are automatically recalculated with the updated data. This is possible because the database's back-end stores each product bought by the customer as a separate entity, and links it to all reports that require this data. So when a record is deleted in one report, the record is deleted across all reports that include it. This eliminates time and effort that would otherwise be spent in manually updating and re-calculating data.

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Data relationships and integrity

Due to to the complications involved, users prefer to enter data manually rather than to look it up using Vlookup. However, this can put data integrity at risk.

During an internal audit, Edward, a newly hired British admin, was taking inventory. He entered all the faucets as "taps" into his spreadsheet, not realizing the regional terminology difference. When the sheet reached Bob, he was momentarily confused, and once he figured out what it really was, had to change them all manually to the US English term.

In databases, tables are linked, so all product details are stored in a source or master table, which is used as a lookup for all other tables. This ensures that data is the same everywhere it's used, maintaining integrity. So if a database is used, our British admin could just look up "faucets" from the product table and avoid the mistake.

Centre Center
Firbre **Fiber**
Color Colour
Flavour Flovor
Analyse **Analyze**
Organise **Organize**
Licence License
Defence **Defense**

Obstacle #5
Data processing is a dangerous game

For yearly reviews, the sales manager of each store totaled up the revenue generated by each product line and calculated the average sales of the products across all stores.

During one review, it was found that a particular product line had done exceptionally well, with a revenue more than three times that of any other product. When the reports were further examined, it was discovered that this large difference was due not to much higher sales, but rather an error in calculation.

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What went wrong?

To find the revenue for each product, the accountant wrote a formula which multiplied the units sold by the product price. He then selected the values to multiply (quantity) by dragging the cursor along those cells. However, he accidentally dragged the cursor too far, and also selected the cells containing the price, leading to an inflated sales number for that product. The same results were used in all subsequent reports, thus exacerbating the error. When the discrepancy finally came to light, the root cause had hidden itself well in the sea of sheets, and it took employees several days to dig out the wrongly processed values.

	A	B	C
1	Product	Quantity	Cost
2	Table (Large)	605	8000
3	Table (small)	403	4000
4	chair (Large)	30	1500
5	table lamp	167	1000
6	Dining Table	369	9800
7	sofa (5 seater)	154	15000
8	Table (Large)	987	7500
9	Table (small)	356	3500
10	chair (Large)	785	4500
11	table lamp	155	3600
12	bed (single)	96	11000
13	sofa (5 seater)	85	

Sheet 1

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The Problem: Formulae being stored like any other data

In Excel, the data for almost all formula is selected by dragging the cursor along the required cells, which makes it very easy to make a mistake such as overlooking cells or selecting additional ones, and cause errors in calculations across multiple sheets.

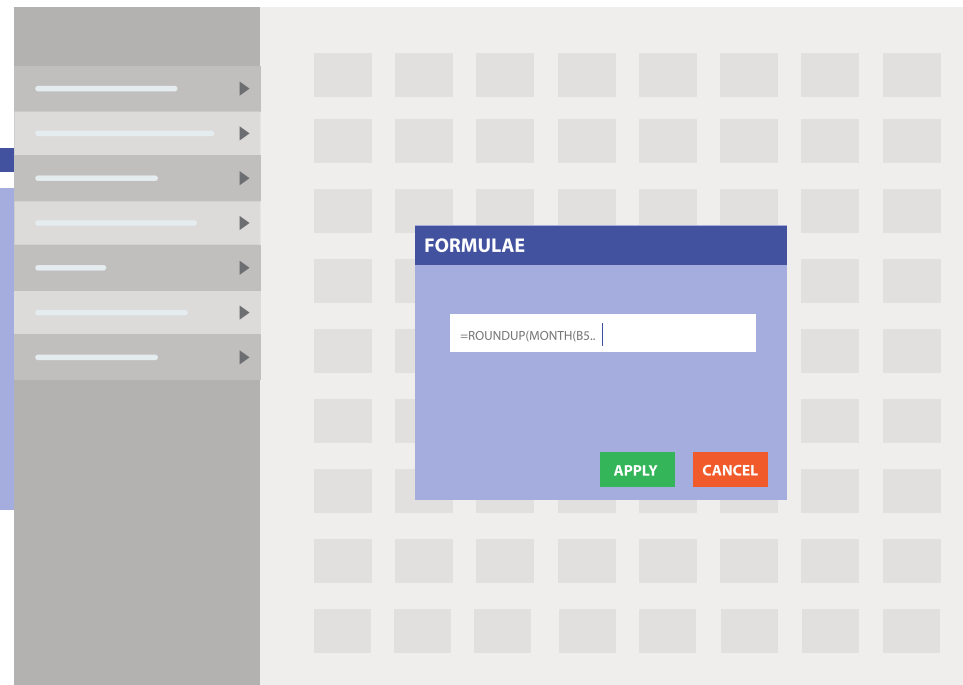# Some more common processing errors are listed below:

You cannot copy a formula into a blank sheet or one with a different data set. This means that you will have to type it out in each sheet. For formulas that are long and complex, this can be quite time-consuming.

- When copying a column containing the results of a formula, the values are not copied. Instead, the formula is copied and applied to the new sheet and generates values from the new data set.

- Some formulae will stop all data processing if they encounter blank cells, especially if macros are involved.

- Applying formulae to merged or deleted cells can cause issues in the calculations.

	A	B	C
1	Product	Quantity	Cost
2	Table (Large)	605	8000
3	Table (small)	403	4000
4	chair (Large)	30	1500
5	######	######	1000
6	Dining Table	369	9800
7	sofa (5 seater)	154	15000
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12	bed (single)	96	######
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Sheet 1

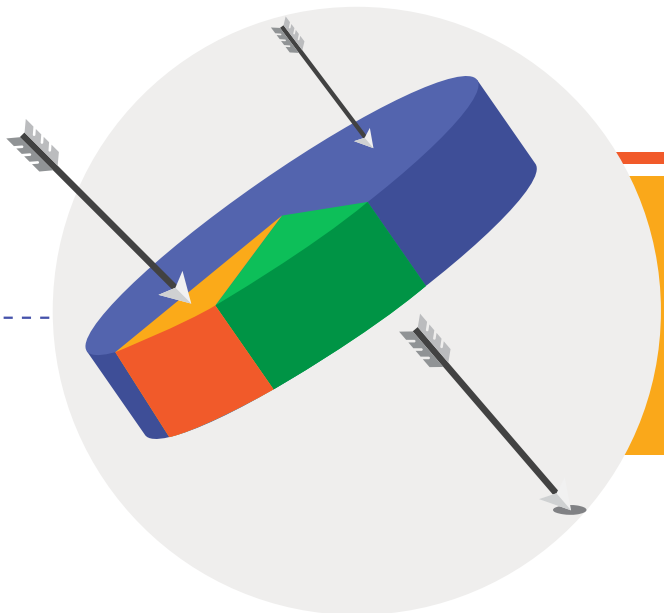ZOHO Creator

The Answer: Specialized fields for formulae

Advanced databases have a separate field for entering formulae. Since data is structured in fields, field names can be used in formulae instead of selecting separate cells, ensuring smooth, error-free calculations, regardless of the data. Since formulae and data are in separate fields both can be reused easily without causing any problems.

FORMULAE

=ROUNDUP(MONTH(B5..

APPLY   CANCEL

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Obstacle #6
Reports do not provide accurate insights

With the financial quarter drawing to a close, the sales managers from various districts gathered to present their reports. The managers each have at least 10 reports comprising pivot charts and tables to cover the various aspects of sales data, which is enough to put the employees to sleep. The pie charts generated by the sales managers have too many slices to be easily read and were not suited to conveying the complex statistical information on buying patterns across each region.
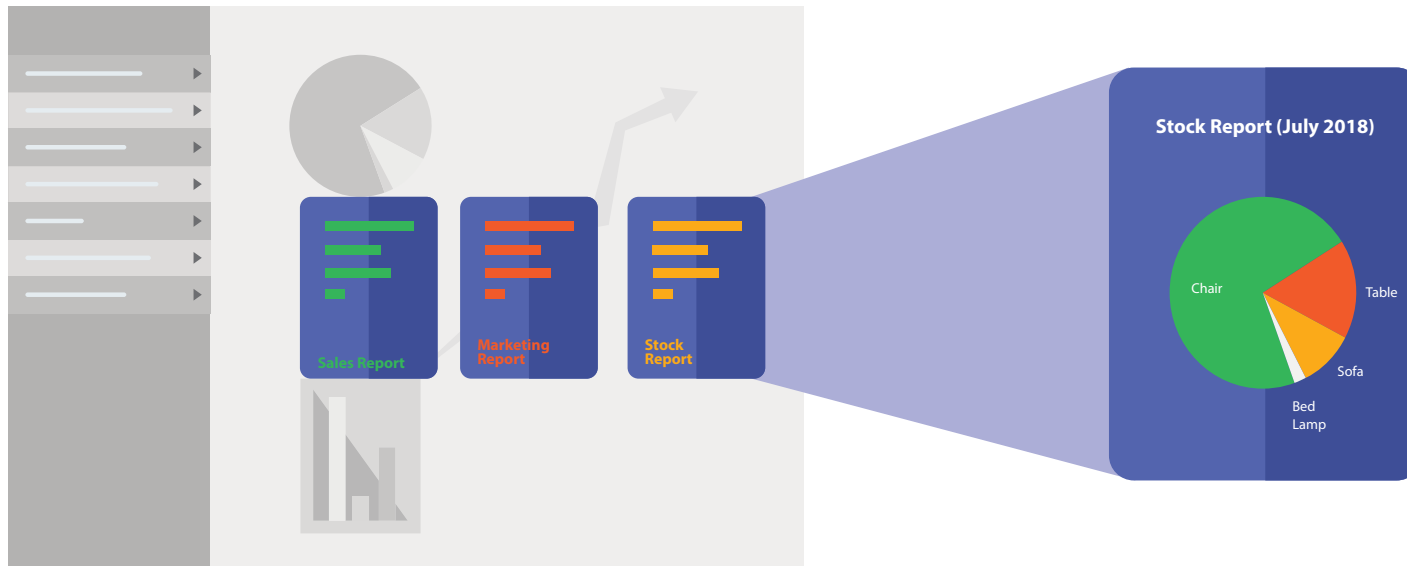
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The Problem: Rudimentary reporting

In general, people usually don't use pivot charts and tables, due to their complexity and the limited insights they provide. They prefer instead to share the data sheets as they are and those reading the sheets have to manually scan for information relevant to them, and might miss crucial data in that process.

Pivot tables and charts aren't an ideal solution to manually searching through spreadsheets. For instance, if there are values with decimal points, Excel rounds them off to the nearest whole number when generating pie charts. If left unchecked, this can cause large-scale data distortion, leading to false insights which may be used to inform critical business decisions.

Another drawback is that pivot reports can only be generated from a single sheet, even if there is related data in another sheet. This can be a huge setback in cases where reports need to be based on multiple sheets.
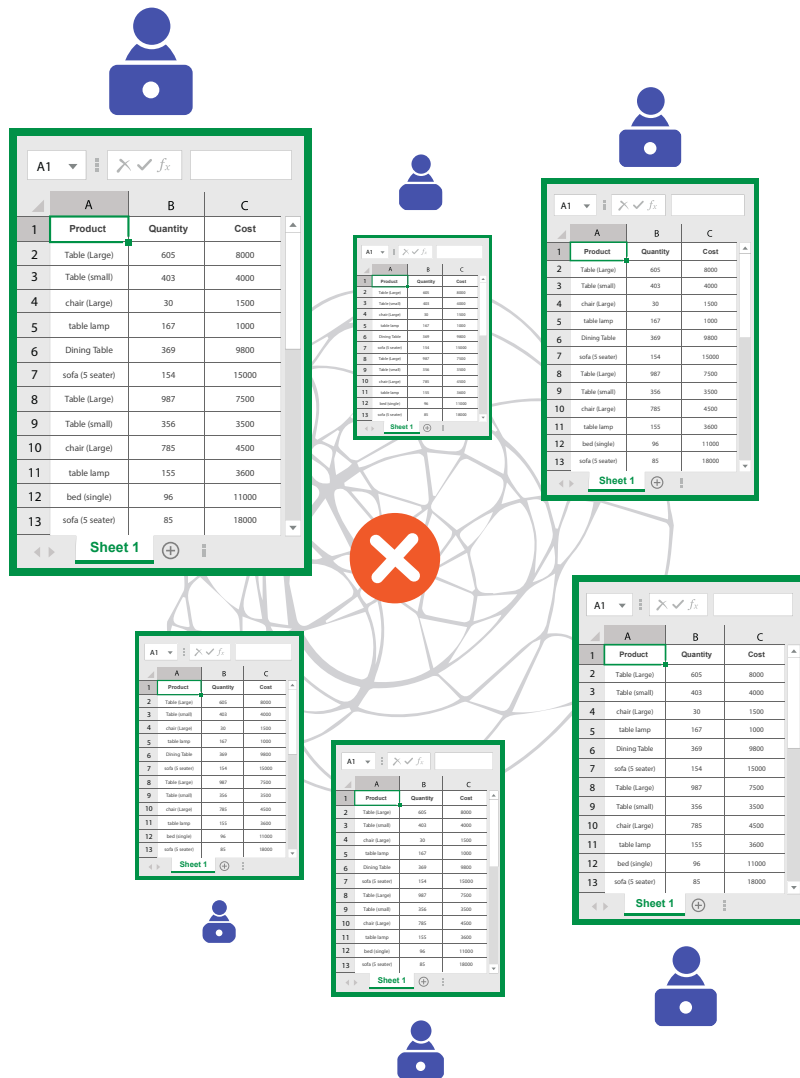
Excel also lacks a dynamic report update feature - when data is changed, the changes are not automatically reflected in the report. The reports must be regenerated every time data is updated or deleted.

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The Answer: Dynamic reports

New-age databases offer extensive reporting options like kanban and map views, providing users with useful insights while keeping the original data intact. You can use data from multiple related tables to get the full picture. The reports translate data in real time; data updates in all tables are promptly applied. You can also schedule the reports to be generated at periodic intervals for analyses at different points in time.

Another feature of databases is the ability to create dashboards. With dashboards, you can view reports from multiple sources on the same screen, and gain insights across data easily. This helps employees and managers make informed business decisions at every level.

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Obstacle #7
Sharing and collaboration; fraught with problems

It's important to stay on the same page with your team to effect successful growth. Bob's employees find their email inboxes flooded with workbooks every time they log on, most of them irrelevant to their daily duties.

At the same time, one spreadsheet is worked on by ten employees, each making their own edits and merging their copies with the original one. The result: the wrong data in the wrong hands, and too many "right" versions of the same data.

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The Problem: Inadequate sharing features

Excel is principally designed for single users, and working offline is not ideal for collaboration.

Later versions of Excel do offer a feature called co-authoring, which is available only if workbooks are hosted on Sharepoint. However, too many people working on the same sheet can still cause confusion. Important data might be altered or deleted, and sometimes whole files may be corrupted.

Owing to issues of security, most users prefer sharing workbooks as email attachments. This not only clogs up email inboxes but also creates multiple copies of the same workbook. After the relevant changes have been made by the users, the owner has to manually check for errors and merge the copies into the original workbook, which is an extremely time-consuming and error-prone process.

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Shared workbooks have the problem that when one user has the document open, no other user can open it. When you try opening a workbook in use, you'll get an alert saying:

"Filename.xlsx is locked for editing by another user."

This makes collaboration very difficult. One more caveat is that shared workbooks do not allow users to carry out most Excel operations like creating tables and reports, assigning macros, adding password protection, etc.

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Security concerns with sharing

When you share a workbook, all worksheets in it are shared. This means the person with whom the workbook is shared can access all data contained in that workbook. This is highly risky if some of the contents are confidential, and could put business security in jeopardy.

You can hide cells and sheets that you don't want the other person to see, but if the file is converted to pdf or other file formats, the hidden data will be revealed.

Some data may also be irrelevant to the person you're sharing the sheet with. For example, a senior manager might need just the overall sales and not individual product sales.
If everything were stored in a single workbook and shared, the manager be overwhelmed by data they don't need.
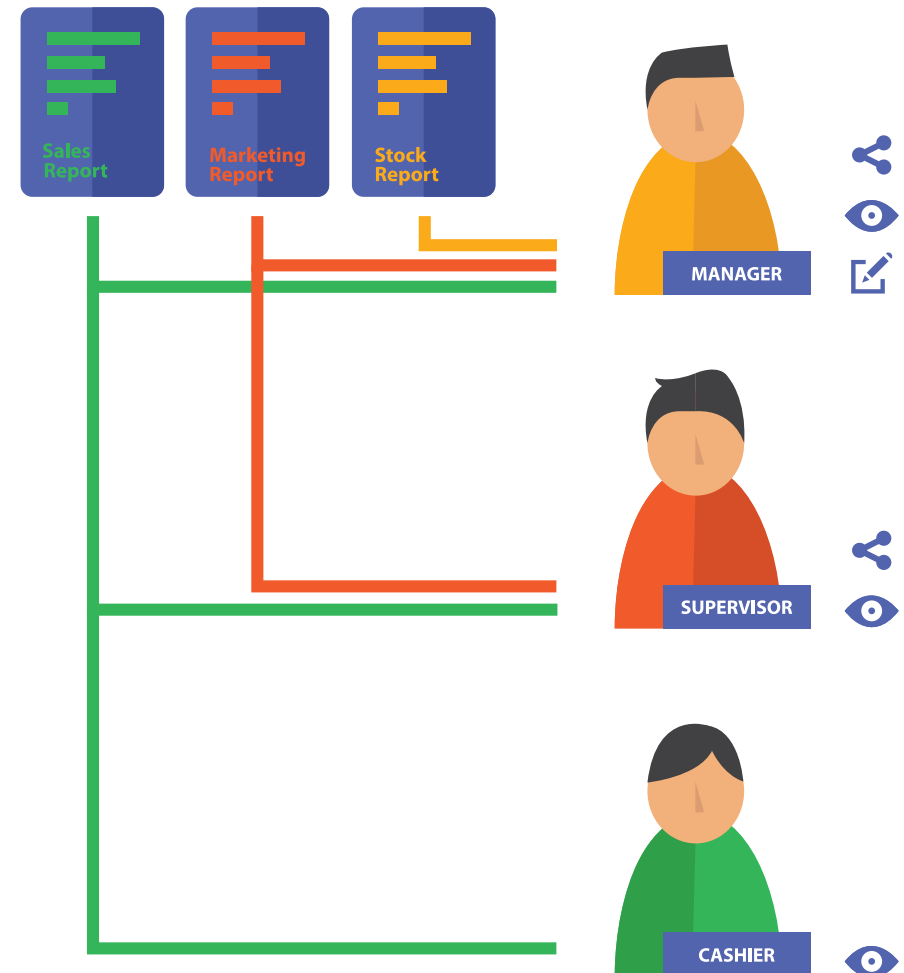
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The Answer: Controlled collaboration

Online database applications support easy and secure sharing with options including role-based access, selective sharing, and field-locking. You can invite people to access your database on the cloud and control engagement by assigning administrator, developer, and user roles.

To prevent data misuse, you can grant edit and read permissions and hide or disable whole fields. Instead of sharing the whole database, you can choose the forms and reports to be shared with targeted individuals or groups (which you can form within the database application).

Databases also allows different views for the same reports. When a report is shared, the user can either access an overview of thestats, or dive deep into the details by clicking on each section for a more thorough summary.

Obstacle #8
VBA gives an illusion of automation

Sending routine emails for updates, notifying suppliers when items are understocked and customers on arrival of their orders, approving or denying requests for off days, and sending reminders to submit credentials when the due date is close are just some of the tasks that Bob and his employees must perform manually when working with Excel. And, given the time the employees have to spend on them, productivity is greatly reduced.

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The Problem: Excel's simplicity

Excel, even with macros, is designed more for localized functions, number crunching, and running iterative financial analyses.

Every one of the processes, however connected or sequential they are, is treated as a separate, disconnected task by Excel. This means that data-based tasks like sending emails and reminders, need to be taken care of manually. The more people and processes are involved, the more time is needed to ensure everything is carried out. Imagine manually checking data across hundreds of sheets and sending individual emails to fifty people based on the results, does that sound like the best use of valuable resources?

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The Answer: Automation at the core

Online database applications support extensive automation; one button click can trigger a whole series of actions to complete all tasks in the process. Imagine you need to send an email to your suppliers when your stock runs low. All you have to do is set a threshold value, and when the stock falls below it, alerts are automatically sent to whoever needs to approve sending the emails, they just have to click to approve, and emails with all the required details are sent in bulk to the correct suppliers. Think how much time that saves!

STOCK LOW

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Epilogue

From Bob's story, we can conclude that while spreadsheets do have their merits, databases are the more efficient choice for running a business efficiently.

One hurdle, however, that often puts businesses off using a database system is the complexity involved in setting it up and using it. The level of complexity depends on the type of database that's used; an on-premise database like Microsoft Access requires elaborate server architecture and other auxiliary hardware. A good knowledge of SQL is prerequisite for using a typical database software; something that might put small businesses off.

Zoho Creator is an online database that lets you manage your data and processes with custom apps. The drag-and-drop builder makes it possible to build forms, reports, workflows, and dashboards without needing complex programming skills. You have all the benefits of a powerful database without the accompanying complexity. What's more, the apps you create are available natively on mobile, so you can work even when on the move.

ZOHO Creator

About Zoho Creator

Running a business is no mean feat, and we believe we can help. Rapidly build custom applications that are a perfect fit for your business, or choose from our extensive range of pre-built apps and modify them. The best part? You don't have to be a programmer. Just sign up, pick a plan, and start building!

Great brands that trust us

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We'd love to talk! Reach out to us

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