

# Excel® Functions and How They Improve Efficiency



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Many who have used a computer in the office or for personal use with general productivity software are familiar with basic spreadsheet manipulation and related software features in Excel®. Often, people frequently use the software for various business math maneuvers or database management of repetitive information. However, Excel® as a software program tool offers far more than just basic accounting and lists. Because the software also comes with built-in formula features, Excel® can be used to create powerful interface files that can be tailored to specific businesses uses, simultaneously capturing data and organizing it for reporting, summary decision-making, and archiving.

The Excel® software program comes with over 300 different functions and formulas integrated as tools, ready to embed into a file when a user needs the particular feature present. That said, not all of the formulas and features are readily available and visible to a user at first. The tools can be used to help with statistical measurement, enhanced mathematics, search and find features, and text manipulation.

By knowing and understanding how to use some of the more powerful functions available in Excel®, a user can then increase his familiarity with the software which in turn increases his speed of quality output. Additionally, a user can easily teach others how to use the same

functions, spreading the knowledge in the office place. The user can also leverage powerful information and data-crunching tools that can take large amounts of data and manipulate them quickly. The most important benefit, however, is how these formulas can radically improve a business or user's efficiency and productivity in manipulating data.

### **Clean, Clear Decision-Making Tools**

There is no question that Excel®'s ability to take cells and cells of data and reformulate them into visual charts, graphs and comparative shapes offer a powerful tool for decision-making and strategy. Whether as an individual or as part of a management team, decisions often have to be made with summarized data and in short discussions. Thousands and millions of dollars of resources can be redirected on the whim of such discussions. It's no surprise then that the most adept with Excel® tools regularly leverage the software's chart-making options to get their point across effectively.

The chart choices provided cover everything from the standard pie chart to trend analysis and scatter shot display on graphs. Additionally, Excel® 2010 now offers expanded display options as well as three-dimensional display, making even the simplest of charts look far more professional than previous versions of the software did.

By improving how data is displayed, it becomes easier to comprehend, particularly when a presenter is trying to convey a specific point. Rather than trying to teach someone how to read the data, Excel® allows interpretations of the data to be communicative intuitively. That makes communication easier and more successfully in turn.

### **Multiple Keyboard Shortcuts**

Like most Microsoft® programs, Excel® also comes with keyboard shortcuts that allow a user to make redundant tasks easy to replication with two keystrokes rather than multiple menu choices. When a spreadsheet requires a significant amount of the same exercises to be repeated as the user is developing the file, the shortcuts reduce time and interruptions from writing flow. Keyboard shortcuts are far more consistent with other keyboard data, so the user can literally flow from data entry to a function quickly and return back to input in seconds. That reduces time spent in development and how long a project takes to produce and put together.

Excel® comes with a set of standard keyboard shortcuts already built in and integrated with the software. Older versions of the software used to identify these codes by signifying the first letter of a windows screen menu choice. However, Excel® 2010 did away with these hard-coded choices. Now a user can set up a keyboard code any way he likes, working with those

features he uses the most and ignoring those he doesn't use at all. The only thing a user has to worry about is forgetting which keyboard code works on a particular task. If he sets it up for two different tasks, only the last recorded task will be triggered by the keyboard shortcut. The earlier version will be overwritten.

### **Macros - Excel®'s Own Programming Feature**

One of the best and oldest features of Excel® is the macro. In essence, the macro is essentially a custom program built inside Excel®. However, it's far easier to create now since a user has a choice of either using the old record-act-record method or actually being able to write the macro code itself for more extensive tweaks and features. Granted, the macro has to function within the Excel® environment to work. However, this tool can allow a power-user to develop some seriously customized programs specific to his own needs and business.

Again, similar to the keyboard shortcuts, macros allow an Excel® user to cut down the time spent performing repetitive or simple tasks. This allows him to spend more time focusing on true analysis and creating useful products versus having to plug data into each cell to get the same results. A basic but powerful example of this principle is how a stockbroker can create a portfolio projection model using macros. By designing an entire spreadsheet

reams of past stock performance data, a number of exercises to occur when specific criteria is inputted into special fields, and allowing a feature to trigger a calculation, a broker-user can design a model that can easily show a client the possibilities of investment return in an instant. Further, the results can be coded to be displayed visually, allowing the client to not only see the results, but the range of possibilities and how his investment could behave. The macro cuts down on all the time the broker would otherwise need to input each cell and display the data numerically.

### **The VLOOKUP Function**

Unlike the basic search feature available in the software menu bar, the VLOOKUP feature can be used both for a one-time search as well as a repetitive code. This allows a user to code the function into a macro as well as just a formula. The versatile function allows a user to scan and quickly filter through a large amount of data quickly in a spreadsheet file, identifying those data cells that represent a character match.

However, the formula isn't just usable for a data comparison; it can be used for identifying ranges of data as well, depending how a user defines the function's parameters. The quick find-and-isolate tool allows a user to crunch large amounts of data quickly, isolating cells and their information for further manipulation. The user then cuts down the amount of

time spent doing research and increases the amount of time available for analysis and production. That of course is a far better use of time, especially when a company is paying people for their labor by the hour.

### **IF-THEN Formulas**

For those who remember what writing small programs in DOS was like, there was a lot of reliance on what were referred to as "if-then" statements. Essentially, these statements controlled how a computer would operate within the parameters of a small program. If a specific condition occurred, then the computer processor would follow another set of instructions. Many programs and bodies of coding today still use variations of "if-then" statements, anticipating multiple contingencies and responding accordingly when they occur.

Excel® can be easily programmed to respond with specific results using the IF Function. Set up to basically look at a cell or a group of cells to determine if a condition exists, the function will then perform a set task and produce a result. This can be something as simple as an alarm when a certain parameter is met, or as complex as initiating an entire sub-program in and of itself for each contingency written into the function.

Investors and stock brokers love the IF function because it allows them to tailor Excel® to produce all sorts of calculations and graphs, depending on certain

conditions occurring. As a result, a broker or investor can easily write a number of scenarios and then just plug in the data as the scenario occurs to see what the range of results will be.

Engineers make wide use of the IF function as well, running simple models and tolerance testing when specific parameters written in. The results allow engineers to crank out multiple calculations all at once to determine if their assumptions are correct in designs or if changes are needed.

Even in macros the IF function is frequently used, especially by power users who write their own macros rather than recording them. The feature provides an easy way to set up different directions for the macro program to work in depending on the different input parameters set up by the user.

### **The Drop Down List**

In some cases the actual data needs to be shared and distributed. However, just giving someone a pile of data, even if it is organized by column, isn't very helpful. The data needs to have some way which it can be organized to be useful. Granted, there's the basic sort feature from the menus. But if a user wants to provide an effective product, he will include drop down lists.

While the benefit of a drop down list is fairly straightforward, giving a person a list

of options on how to sort the related data, it can make manipulation of data fairly easy no matter who the information is shared with.

The drop down function can be embedded into a particular cell or it can be layered into the top of a spreadsheet for easily resorting of an entire spreadsheet. Each column can have its own drop down menu, making for multiple displays of the same data, depending how a reader needs to see the information. The approach is highly efficient for regular reference of large amounts of information on a frequent basis.

### **The COUNTIF Function**

One of the problems with human input is that mistakes are occasionally made. Where large amounts of data are involved, duplicate entries can occur which can cause problems. A list of names, account numbers, social security number identifications, and addresses can all suffer a problem where mistaken or double-entries occur. They are also extremely hard to find when buried in hundreds or thousands of rows of data.

The COUNTIF Function allows for duplicate entry searches over large spreadsheets in very little time. The function will scan the entire spreadsheet, row by row, matching up data and conditions as defined in the function



parameters. When finished, the function will confirm a duplicate entry or a clean spreadsheet. The benefit can be invaluable where a user needs to process large spreadsheets regularly and has little time to manually check each row for accuracy. In terms of efficiency, this tool ranks up at the top of the list in terms of usefulness and practical applications.

## The Math Functions

For those who are not math inclined, one of the older benefits of Excel® is that it comes with a number of mathematical functions. There are a variety of tools in this group of functions including:

- Summation
- Averaging
- Counts
- Rounding, and
- Standard Deviation

Where a user needs math calculations to occur automatically, the above tools can be very helpful in automating math tasks, producing the desired type of results when the input data may be changing on a regular basis. Additionally, like other functions, these tools can be embedded in macros or larger models that perform multiple tasks simultaneously to produce results. Users can again cut down lots of time associated with performing repetitive math tasks by just putting in the requisite number of math functions to make the work electronic in nature.

The math group can be particularly helpful when a user is working on statistical modeling through spreadsheets. Where a multiple regression model needs to be set up and run repeatedly, many of the features of the math functions can be integrated into the model to produce different ranges of results, depending what is being tested or needed.

Often, repeat tests are needed with changing data sets and groups. Instead of going through the task of rewriting an entire statistical formula, a user can simply set up the necessary math functions once and then just enter in the changed data set each time to test new results. The functions stay the same but the input changes for new results. This benefit makes it very easy for a statistics user to run different data groups through the model to arrive at assumptions about how the data behaves when measured.

## The Pivot Table

Many times businesses keep large array of data on every transaction that occurs. This frequently appears in accounting reports that can produce up to fifteen different fields per transaction line. However, often, a decision-making just needs to know what the total impact is associated with a particular vendor or expense code. It can be a significant amount of manual work, even in a spreadsheet, trying to calculate the

totals for every vendor. Further, each month the data can be different, so the same vendors may not pop up in the latest months report versus that from the previous 30 days or 90 days. The pivot table features provides a practical answer.

Instead of dealing with the data each time as if it were a unique set of rules, the pivot table crunches the data each time, producing totals for the various fields and aggregating the lines where the particular identifier is the same. This sort of tool works very well when multiple lines of transactions have the same vendor, for example, and need to be grouped together quickly to see total net impacts. When set up properly, the pivot table to runs all the plusses and minuses for a given factor and produce a net total associated with that identifier.

Those who become adept at using a pivot table can produce some fairly amazing reports with monthly data or similar types of downloaded information. However, the weakness of a pivot table is that it hides the details. For any kind of audit review or in-depth questioning, a user still needs to be able to understand how the underlying data was produced to explain the results summarized on the pivot table report. If the underlying data has problems, the pivot table summary won't be any better in terms of quality since it is basically just and aggregate of the mistakes in the transactions.

## **The Financial Functions**

For those who regularly have to perform financial functions for payment, asset depreciation, interest rate calculation, yield, or currency calculation, Excel® also comes with dozens of financial function tools to meet these needs. In fact, many of the features designed into Excel® were intended to meet the same benefits provided by the decades old HP calculator 12C. However, the functions in Excel® in some cases are far easier to use than that old calculator was.

The financial functions are designed in groups, performing all the necessary tools needed to produce professional results in an automated fashion. Again, a user can use these tools in two ways: as one-time direct result producers or by embedded the formulas into more complex spreadsheet layouts. Many times financial managers can create entire portfolio models embedding multiple financial formulas in different sections of a spreadsheet to produce desired results.

Sales projects or asset valuations can also be produced with various financial formulas that project how assets with either appreciate or depreciate in value, depending on what factors are included.



When the above tools are combined with currency converters, then the same data can be adjusted for international transactions and movement of costs over country borders.

Because there are dozens of functions available, there are a variety of ways these financial functions can be used. Not every tool has to be manipulated and often many users only use maybe a handful of all the financial functions available. However, knowing what these tools are and how to use them can increase the power of using Excel® greatly. Many brokerages and financial institutions make it a position requirement to understand these features of Excel® and be able to use them effectively.

## **Use and Training**

There is no question that the above list of functions within the Excel® software is just scratching the surface of what's available to a power user. The use and wide array of benefits available provide countless ways a user can leverage the software to automate data manipulation and reporting. Further, hundreds of calculations can be embedded into spreadsheets, allowing them to occur behind the scenes while a user just has to worry about the primary input and output for decision-making.

However, the large majority of these tools are not intuitive the way they are designed in the software. It takes an understanding of how to place them in a spreadsheet and write the relevant coding to make the functions work properly. That takes time, training and practice for users to become effective at relying on and taking advantage of the available tools.

It's a smart move for an individual or a business to hire an expert trainer the first time an introduction to Excel® functions are being taught. This allows users to focus on learning the new tools and not spend time and energy worrying about whether they are doing things right. Once the basic level of understanding is in place, users can then build on their new foundation, expanding the use of Excel® functions with practice and experience. Before long, the idea of using a pivot table or running expansive financial models will feel like a natural thing, cutting down on wasted time, endless hours of data input, and labor costs associated with manipulating large amounts of spreadsheet data. That represents the true efficiency these Excel® functions can produce, both for an individual as well as a company.

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