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For desktop, web, mobile and server

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LEGACY OFFICE SYSTEMS ARE DAMAGING BUSINESS

Legacy office applications can be costing companies billions of pounds – yet most companies don't even realise it.

Countless businesses across the UK, and indeed the globe, are supporting critical business processes with systems developed in basic spreadsheets and database systems such as Excel and Access. With research proving that 80-90% of spreadsheets contain errors and missed calculations[1], these systems are a serious risk to business and can have far reaching consequences for the bottom line. What's more, many businesses are not even aware that they are operating on these readily accessible office software solutions.

In order to operate profitably and productively and compete effectively, companies must look at their business processes and ensure they are using systems which are robust and error free. But how?

Professionally developed software solutions identify and disentangle legacy code, to create a system that is specifically designed for the business. Based on appropriate platforms, programming languages and coding, the result is a system that is effective, auditable and documented.

LEGACY OFFICE SYSTEMS – THE HIDDEN RISKS TO THE BOTTOM LINE

Many critical business processes are supported by generally available office software that have grown beyond their original purpose, without businesses even being aware of the risk. Spreadsheet or database solutions such as Excel and Access may have originated as a short-term fix, but years of use and an increasing number of users means these processes are no longer fit for purpose and are silently damaging businesses across the globe.

Excel and Access are powerful tools. Excel has a large array of functions such as VLOOKUP, the ability to link to data sources and third-party products, and is programmable via VBA to allow it to be used as a development function in its own right. Indeed, it is used by companies everywhere and is considered by some as the swiss army knife of business management.

Similarly, Microsoft Access is an established and solid tool, perfect for use in certain environments. Over time, however, as its use expands beyond the initial purpose, the software becomes fragile and unreliable.[11]

Yet, the development of support systems based on these office technologies have an inherent lack of rigour, structure and auditability. Whether human error, incorrect calculations, copying and pasting or change of managers, the flexible Excel and Access solutions are leading many companies to make erroneous conclusions with significant impact to the bottom line.[9]

The cost of getting it wrong

A spreadsheet summing error saw Marks & Spencer wrongly announce that sales had grown by 1.3%, when in fact they had fallen by 0.4%.[8]

A cut and paste error resulted in a Value at Risk model being miscalculated, costing JP Morgan a staggering $6 billion.[2]

A similar cut and paste error cost TransAlta $24 million.[3]

Hiding cells instead of deleting them cost Barclays Bank millions during the 2008 financial meltdown.[4]

Business processes are becoming more complex, more comprehensive and more digital and spreadsheets just aren't up to the job

NOT SUITABLE, SUSTAINABLE OR SAFE FOR BUSINESSES

Spreadsheets and database systems are an excellent tool for businesses when used for short lifespan business activity. The optimal use of spreadsheets is to build a model that will be discarded once the answer is found and to be used by, or in collaboration with, the originator.

Spreadsheets should not and cannot be used for long-term business processes, yet a significant number of businesses do rely on processes that have been built up over years from an Excel spreadsheet. These silent killers are causing untold damage to businesses through a number of inherent problems.

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"Spreadsheets are stretched beyond their useful capability because they are cheap and versatile, and it is easy for a spreadsheet to evolve from a purpose-built tool into a bloated mess. If you have multiple people using the same spreadsheet over an indefinite amount of time, you run the risk of data inconsistency, access issues, and other significant problems like file deletion."
Talve, Founder and Managing Director of The Expert Institute.

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NOT SUITABLE FOR LONG-TERM OR WIDE-SCALE USE

Whilst generally accessible business software is good, it must not be used on a wide scale. Research from the International Data Corporation (IDC) in 2017, showed that 46% of users report that spreadsheet file links can easily be broken when files are moved, deleted or overwritten – which has significant impact on any linked files. This causes chaotic effects for the organisation internally, with potential policy and external compliance violations possible.[1]

Indeed, research carried out by Raymond Panko, Professor of IT Management, found that most of the spreadsheets used by organisations contain errors, and a considerable number of those are serious. In one case, the error would have caused a discrepancy of more than a billion dollars![7]

CREATED BY AN ARMY OF PROFESSIONAL AMATEURS

Despite 30 million advanced spreadsheet users worldwide[1], almost all such modellers have no formal training.[5]

This leads to an army of professional amateurs committing errors on a daily basis, the most significant of which is the misapplication of programming logic. Once committed, these are the most difficult errors to find and correct and can render a whole system or individual processes incorrect and ineffective.

With only 20% of individuals having their spreadsheets checked and tested for errors by colleagues[6], and Coopers & Lybrand finding errors in 90% of spreadsheets that they audited[8], it is clear to see how widespread the problem is.

These professional amateurs think they can have a go at building models in office systems, but in reality, there is no rigour in the logic, application building and checking. There is a lack of documentation, testability and maintainability rendering spreadsheets inappropriate for long-term usage and ongoing developments for multiple users.

The misapplication of programming logic in spreadsheets and other office systems is common place, making errors difficult to find and correct and in turn, rendering a whole system incorrect and ineffective.

HEAVILY COMPROMISED BY COPY AND PASTE

Studies show that 51% of individuals use copy and paste as a method of acquiring data in spreadsheets[1]. This widespread use introduces a strong possibility of human error, by not copying what is wanted and then it becomes lost in the web of spreadsheets and is increasingly hard to trace back to the original mistake.

UNTRACEABLE MISTAKES

With numerous spreadsheets making up business processes, identifying and tracing the mistake can prove an impossible task. Studies show that 44% disagree that lineage of data can be tracked back to the source and 38% disagree that analytics performed in spreadsheets are traceable.[1]

Alongside all the other issues with legacy systems, the integrity of spreadsheets and readily accessible office systems is severely compromised.

COMPLEX LOGIC, SPAGHETTI FORMULA AND REFERENCES

It is extremely difficult to develop accurate spreadsheet models. The software development community has invested extensively in languages frameworks and tools to improve the quality of software, but little work has been done to improve the quality of spreadsheet modelling.

The application of conditional logic, looping logic and macros, enables a complex spreadsheet to be created, but the problems still remain as spaghettified formula creeps in. Extensive use of macros in a spreadsheet is a clear indication that it is not the best platform for modelling, as the result means dealing with all the complexity of software development yet suffering the weaknesses of spreadsheets.[10]

> The sheer number of spreadsheets, coupled with 'homespun' developments, and the difficulty of reviewing their logic, makes spreadsheet development the Wild West of the modelling community.[10]

BAD DATA EQUALS BAD RESULTS

Legacy systems are only as good as the data entered, and it is all too easy to enter bad data into office software. Human error, such as one wrong keystroke, and a formula is replaced with a static value, rendering the calculations meaningless.

Systems such as Access and Excel do not handle data well, due to a lack of development disciplines which leads to a high risk of errors in the data. Whether it is an empty field, a leading zero, data accepted into the wrong column or a row not included in a summation formula, these systems have limited ability to ensure data records are complete, unique and adhere to a consistent format. Due to these limitations, there is a risk that calculations won't function properly and, because of the file design, data can become corrupted over time.[11]

In contrast, professional programming follows strict development disciplines in order to eliminate bad data errors.

COLLABORATIVE WORKING ISN'T SUPPORTED

Concurrent use of spreadsheets and readily available database management systems can compromise accuracy of data, as they are not designed for collaborative working.

Research shows performance in Access declines when used by more than a few people concurrently as it doesn't natively support transactional record handling.[11] Similarly, when sharing a spreadsheet with other users, because the spreadsheet is custom to the originator, there is high scope for confusion and mistakes, and if two people make changes to the same record at the same time, only the last one will be saved.

Professionally developed applications, with a rigorous approach to coding and development, have familiar and transparent structures, eliminating all these issues.

REMOTE ACCESS ISN'T POSSIBLE

Legacy systems are not designed to be used with web-based applications accessed via a browser, so remote access is not possible. This severely limits where and when a system can be accessed and used, and adds to the problem of collaborative working. Remote access software can provide a solution to this, but there is additional cost and the problems with the legacy system still remain.

Web-based software solutions provide a system which can be remotely accessed from any web-based device, significantly increasing not only the accessibility, but also allowing concurrent working.

MISTAKES SPREAD QUICKLY

"It's really easy to make an error in Excel. Even if we don't make errors big enough to get our names in the papers, we still harm our business by operating on invalid data. The trickiest thing about Excel errors is that you may not ever realise they are there." Judi Otton, CEO of GrowthCast

A simple mistake in a spreadsheet will quickly spread throughout a business causing untold, and even unrealised, damage.

With spreadsheets being used by multiple users within a business, you are unable to keep track of how many people have changed the spreadsheet. As they don't follow a set design template, some users may find it unreadable and confusing, leading to multiple versions existing and stored in numerous places. Very quickly, it is impossible to know how many different versions exist, where they are stored and which one, if any, are accurate.

LEGACY OFFICE SYSTEMS NEED TO BE MORE ROBUST

In order for businesses to operate effectively, legacy office systems have to be more robust – so how can this be achieved?

To develop the right business processes, you need to have a strong model and accurate data. Spreadsheets and office systems simply aren't up to the job, but there is an easier way.

A professionally coded system will transform a business, future proof it and increase productivity, accuracy and ultimately the bottom line in the long term.

WHAT IS A PROFESSIONALLY CODED SYSTEM?

A professionally developed business system is based on a partnership between logic and code.

This means that a well coded system instantly eliminates spaghettified formula and references and is maintainable and testable; something which is crucial for any business. A coded system, such as an internet or intranet, will ensure business processes are relevant, maintainable, usable and future proof.
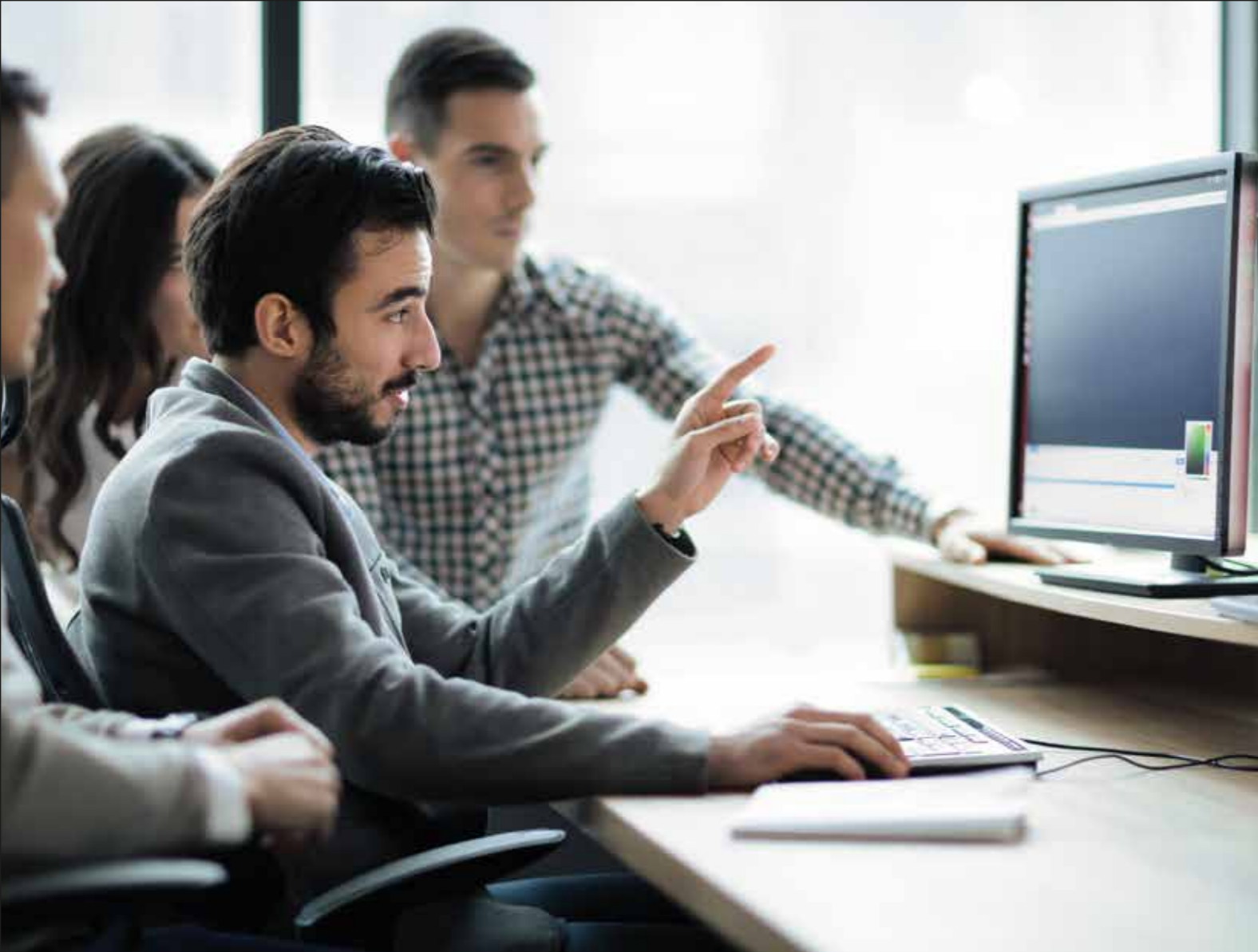
MOVING TO A PROFESSIONALLY DEVELOPED SYSTEM

Moving to a professionally developed system is costly and too difficult – wrong!

Adopting rigorous software development processes has a significant positive impact on business, yet many companies are hesitant as they mistakenly believe that it will be costly and time consuming.

Studies show that the top 3 concerns of switching away from stand-alone spreadsheets were concerns about lengthy implementation times, compatibility with other applications and high costs[1]. However, whilst in the short term it is an intensive process to unpick the years of spreadsheets and formulae, the long-term benefits are tangible and heavily outweigh keeping a legacy system.

As the number of concurrent users and need for added functionality grows, a professional and custom-built solution is the most viable option. Professional companies have expertise in porting spreadsheets into professional coded systems, in order to deliver a bespoke system for a business that will ensure a robust process, productivity and maintainability for now and for the future.

THE BENEFITS OF A PROFESSIONALLY CODED SYSTEM

A professionally coded system will revolutionise a business.

By adopting a professionally coded system and losing the legacy systems which are slowly strangling organisations, businesses will benefit from:

TRANSPARENCY	a transparent process which is easy to use and can be shared with multiple users.
TESTABILITY	a system that can be tested, which is a crucial part of maintaining code and the process on which a business operates.
ACCESSIBILITY	a system which can be accessed via any device, anywhere and at any time.
CONCURRENCY	multiple users able to access, amend and update the system, all at the same time.
MAINTAINABILITY	a system that can be easily maintained and updated in line with business needs.
PRODUCTIVITY	eliminating errors in the process, some of which may be unknown and will have a direct impact on a company's bottom line.
FUTURE PROOF DESIGN	supporting remote access, collaborative working, concurrent changes and a design that can adapt easily to future challenges.
DOCUMENTATION	a professionally coded system will be documented, allowing ease of use by multiple users, effective updating and future proofing.
SCALABILITY	a coded system can be adapted and scaled to fit the changing needs of a business.
SECURITY	coded systems have strengthened security to ensure all data is safe and protected.

CASE STUDY: American Manufacturer Overhauls Legacy System

A large manufacturer in America had a 15 year old spreadsheet at the heart of its operations. Used to calculate cable and conduit runs for their custom equipment, the spreadsheet created a bill of material and labour timings, providing an overall cost for the product.

Technological developments meant that the spreadsheet needed to be modified, to include new electrical options. However, nobody knew how the spreadsheet worked and were unable to decipher the spaghettified formulae. With the originator no longer at the company and untraceable formulae, the company soon realised that they were unable to update their process and couldn't check to ensure the calculations they had been working to were in fact correct.

Computair Consulting were approached to help solve the problem, and immediately used their in-house team of experienced professionals to pick apart all the embedded logic. Several errors were detected during this process, which had gone unnoticed because the spreadsheet wasn't testable.

To provide the right software solution, Computair Consulting wrote new logic, with a long set of test cases for the client to verify. The new system was built on code that was maintainable, allowing exsiting features to be changed and the new technological developments added. The test cases were then re-run to ensure that the changes had not caused any errors or breaks in the system.

Although a difficult process, it has resulted in the manufacturing company operating with a robust, maintainable, documented and, most importantly, accurate process.

ABOUT COMPUTAIR CONSULTING

Computair Consulting is a software development company based in Toddington, UK with over 35 years' experience of serving companies across the globe.

With a passion for developing and engineering smart software solutions, an in-house team of experienced programmers deliver bespoke application development and software solutions for the simplest through to the most complex business issues.

With unrivalled mathematical, engineering and coding experience, all software is developed in-house, ensuring bespoke software solutions are delivered to individual clients which have the ability to link to any existing computer systems.

Collaborative working with clients ensures full support and solutions, with minimal pain and disruption, are provided. Business issues are fixed with bespoke software solutions for web, mobile, desktop and server, including the enhancement and maintenance of legacy systems.

Computair Consulting has proved to be the ideal partner for industry software for engineering calculations and automation by solving all software problems.

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