Fearnsides and Associates

Claims, Contract, Delay Analysis and Quantum Consultants
for the Construction and Engineering Industries

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BIM, Computer Automation, Computer Applications and Digitalisation

Computer automation has been with us for many years. However, the integration of information into databases to enable information to be stored, searched and easily identified for all components of the whole building cycle is known as **Building Information Management (BIM). BIM** consists of 3D digital models and 2D drawings and attributes of all the components required to build construction projects inclusive of costs and much more.

The component elements of 2D drawings and 3D models (along with their attributes: size, type, supplier, material, warranties, costs, defined specification and many more) are linked to a database that stores the data for information purposes. Each component/element (and attributes thereof) used in the construction build and management process can be traced and logged for: ***what it is; where it is; who supplied; who installed; when was it installed; when was it checked; who checked; what was its price; was it a variation*** etc… the list goes on.

We are in an age where a full documentary trail of the entire building process can be traced at an instant, which obviously reduces the time it takes to perform any forensic investigation. BIM will not cure all ills, but it will go a long way to provide more transparency and openness for the stakeholders in the building process and indeed in any other industry.

However, the vehicle to log and store all this information is the called a **database**. To interrogate databases knowledge of the **Structured Query Language (SQL)** is required, not always, but it will enable much more efficient and structured searches for information. A firm grasp of **SQL** enables databases to be searched for specific records so that they can be downloaded and/or, alternatively, for records to be uploaded into databases and placed in the correct location within the database.

Additional applications written in programming languages such as **Visual Basic (VB), C#.Net** and **Java** can send **SQL queries** from applications to the database. The database will then resolve the queries and send the results back to the person who made the query.

For example, an **Excel** spreadsheet can have a **Visual Basic** programme coded to enable a button pressed on the **Excel** sheet to pop up **dialogue boxes**. The **dialogue boxes** can then ask for the **database name**, **location** and **password**. Further **dialogue boxes** can then ask for the **SQL search query**. Once filled in, the **data** can then be retrieved and placed in **Excel** where the user requires it to be located. Alternatively, the database name, location, password and query statement can be **hard coded** into the **Visual Basic** computer code and all the user must do, is to press the button on Excel.

Fearnsides and Associates realised many years ago that the **digital revolution** was on the horizon and that it would greatly impact the construction industry. To that end **Visual Basic, C# and SQL programming languages** were learnt all those years ago. It has greatly enhanced our ability to research databases to find **causative events** associated with construction and engineering claims and we have computer applications we have written ourselves for such purposes.

We have also used **Visual Basic and C# programming code** to develop applications to demonstrate cause and effect. One of our early applications we called **"Float Map". "Float Map"** enables the user to determine the **dynamic as-built critical path** and **near critical paths** from multiple **P6 programme update datasets** (for example, 36 updates with 15,000 activities each, would be no problem). This method is known as the **dynamic** method of delay analysis. The graphical output is placed in **Excel** so that all can read.

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We have another application called **"Static"** that determines the **as-built critical path** via **planned v as-built % complete attrition** an alternative **method of determining the as-built critical path**, again the output is shown in **Excel**. However, the data for both methods comes direct from the **SQL, Oracle XE or SQLite databases** associated with **P6.** Although **P6** is not required to be on a computer if data comes straight off the **XER data carrier file** that **P6** uses. We do similar for MS Project and other proprietary project management applications. We simply write computer code to suit as necessary. The benefit being it is quick and fast, the real as-built critical path (the most probable) can be determined from a comparison of both methods. As both opposing methods of calculating the as-built critical path are determined (and likewise sub-critical paths), any conjecture as to what the as-built critical path is, is reduced to minimum. Thus, allowing consensus and agreement as to what the as-built CP is and where it lies. Therefore, all that is then left to deliberate is causative responsibility for delay.

We have also developed simple automated graphics as a means of demonstrating cause and effect via the **Visual Basic Application** code within the **Microsoft Office Visual Basic Editor** that comes with nearly all **Microsoft Office** applications. In our case we have used the **Visual Basic code** to automate and use the **"Shapes", "Pictures", "Icons", "Chart"** inserts in **Excel, Word and Power Point** to create automated graphics. One example is the simple delay analysis (for cause and effect) presentation we call **"TimeLine". "TimeLine"** was designed so that a simple bar chart graphic could be created and be used by anyone, and that it should not be bigger than one A3 sheet. No **P6 knowledge** is required (if you can write a date in an **Excel** cell, you can use **"Timeline"**). It can also be reduced in size to fit on to a **Power Point** presentation and can also be graphically produced within the **Power Point** application.

With reference to the above, **Fearnsides and Associates** also provide computer database research and interrogation services using programme code along with writing programme code to help demonstrate **cause and effect** via **delay analysis** and **graphical** means. It greatly speeds up our research time and reduces significantly, through the computer code automation process, **the time it takes to establish cause and effect.**

We therefore offer the following computer application services along with our core Claims, Delay Analysis, Project Controls, Quantum, Contract Administration, Quantity Surveying and Expert services.

Computer Applications, Delay Analysis, Data Analysis and Data Management

- Data Analysis using Microsoft SQL Database, Oracle XE, SQLite, MS Access using integrated VB And C# software applications for searching, downloading and uploading data contained in databases straight in and out of everyone's everyday Excel spreadsheet.
- Data Analysis via VBA and Visual Studio application development (VB and C# code) via Fearnsides and Associates company developed software applications that run MS Office applications *(no need for expensive bespoke software apps)*. For example, our dynamic and static delay analysis applications pull the data straight from the P6 database into Excel and provide visual graphics of the critical and sub-critical as-built path determination via simple menu choices).

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- Building Information Management – BIM - We use SQL search database language to SELECT Column(s) FROM Table(s) ORDER BY Column. Our SQL search statements are coded into our VB and C# applications all you need to up load or down load information is the IP Address, Database Name and Password.
- REVIT and AUTOCAD – apps to look at attributes and review the 3D and 2D models/dwgs.
- Automated visuals and graphics upon Excel spreadsheet and Power Point using VBA code macros.
- MS PowerPoint presentations using coded visuals and graphics