

IAPetus



Quarterly Bulletin For the Institution of Analysts & Programmers

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HEALTH AND SAFETY IN AN IT ENVIRONMENT

There has been a rapid and continuing increase in the use of Display Screen Equipment (DSE) over the past decade.

It is estimated that more than half the workforce in the industrialised countries use visual display units on a regular basis. Health problems associated with the continuous use of DSE has been highlighted in the British Safety Council magazine "Safety Management". A number of cases where users have claimed against employers for upper limb problems associated with continuous use of equipment have also been featured.

It is incumbent on any employer who has more than five employees to implement a written health and safety policy. How does this effect an IT environment? The Health and Safety at Work etc. Act 1974 incorporates a Statutory Instrument, The Health and Safety (Display Screen Equipment) Regulations 1992. In broad terms this requires the employer, where practical, to carry out the following:

- Analysis of workstations – assess the health and safety risks to which employees may be exposed and, where a risk is identified, reduce that risk to the lowest extent reasonably practicable.
- Requirements for workstations – any new workstation meets the requirements laid down in the Regulations.
- Daily work routine of users –

ensure that users have periodic breaks or changes of activity away from display screen equipment.

- Eyes and eyesight – provide, when requested, an appropriate eye and eyesight test. Eyesight tests and basic corrective appliances is at the expense of the user's employer. The employer must allow paid time off to attend eyesight tests or arrange for the test to be carried out at the place of work.
- Provision of training – ensure that the employee is provided with adequate health and safety training in the use of any workstation upon which he/she may be required to work.

The above sub paragraphs are only an outline of the requirements but, as can be seen, there is a necessity for every employer to act on the requirements of the Act. For any organisation that does not have an active health and safety policy the implementation of these requirements can be quite daunting. So how should you proceed?

The first priority is to ensure that you have a safe working environment. There are quite a few risk assessments that should be carried out in the office which include ventilation, heating, lighting, slips and trips, cupboards and drawers etc. This will finally lead us to the Display Screen Equipment User Risk Assessment. A locally produced form should be used to ensure that a record is kept of the assessment as assess-

ments will require periodic update should procedures change or new equipment be introduced. The form should cover the following points:

- Does the furniture 'fit' the user and the work?
- Is the keyboard comfortable?
- Is the display screen image clear?
- Is the work area a risk-free environment?
- Is the software user-friendly?
- Can work be organised so that adequate screen breaks are taken?

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All change in the Robertson household! Now that Christine is turned 2, I have been seduced back out into the world of work . . . and am in 'pig heaven' as Webmeister to the local FE college! Interestingly, I spend a lot of time in meetings as well as actually writing web pages.

The college has both a website and an intranet – part of what I shall be doing is developing the intranet into an exciting teaching and learning resource for the whole college. Christine has settled in happily at

their nursery, and usually does not want to come home at the end of the day.

Well, what else? With the UK remaining outside for the time being, the euro has crept quite quietly into our lives; those involved in international trading seem to have done an excellent job as no great disasters have appeared on the business pages. Let's hope all the gloomy prognostications on 'Year 2000' are an equally damp squib!

Within the Institution, election time draws near. Reading everyone's manifesto, I always think that everybody has so much to offer we ought to make use of them all. So read their words carefully, decide who you want in charge, and send in your voting card.

Outside, the sun is trying to shine... and as it's a Saturday, I'm going to write some web pages for pleasure rather than profit!

Megan C. Robertson

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Each point has a number of sub points for example sub paragraph c above would have the following sub points;

- a. Are the characters readable?
- b. Is the image free from flicker/movement?
- c. Are brightness and/or colour contrast adjustable?

And more.

Once all the questions have been answered the user then completes a certificate at the end of the form which highlights any action or advice required. The form could be held at each workstation or centrally by the Health and Safety Advisor.

The implementation of Display Screen Equipment Risk Assessments can highlight problems that would otherwise go unnoticed. By reducing the risks you could increase

productivity. You could also reduce stress related and musculoskeletal problems (known as repetition strain injury or work related upper limb disorders).

I have been the Health and Safety Advisor for an organisation of 140 personnel both in the UK and the former Republic of Yugoslavia and have carried out health and safety audits on a number of commercial businesses. During this time I have developed a number of documents useful to Health and Safety personnel which include The Policy Statement, the Health and Safety Policy Handbook, Health and Safety Notice to Contractors, General and Generic Risk Assessments and the Display Screen Equipment User Risk Assessment. These could be provided, for an administrative charge, on disk in MS Word 95 format to be tailored to suit individual needs. If anyone

would like copies please contact me via e-mail at chrisgerryUK@compuserve.com or write to me at, Lania, 38 Parsons Heath, Colchester, CO4 3HX.

Chris Gerry
MIAP, FISM, MInstTA,
AIIRSM

Further useful information can be obtained as follows:

HSE Books
PO BOX 1999
Sudbury
Suffolk CO10 6FS

Chris Gerry has completed a Certificate in Safety Management and is an Associate Member of the International Institute of Risk and Safety Management.

Council Elections

Well – it's come to that time of year again – and we've had all the nominations in from those standing for election or re-election to Council which has resulted in the following eight people standing for six places (five for three years and one for one year).

Their manifestos are printed elsewhere in this issue of *Iapetus*. A voting card should also be included – please fill it in and return it to us!

Jim Bates, Alex Robertson, Ian Hargrave, Anne Grey and David Morgan retire by rotation, and Gordon Bradley resigned his seat earlier this year. Anne Grey is not standing for reelection this year.

As in previous years, voting will be by single transferable vote

for six separate places. The first five persons elected will get the three year places and the next person will get the one year place.

As is common practice, the runners-up will be considered should any casual vacancies occur on Council prior to the next election.

Candidates for election to Council 1999:

Jim Bates
Ian Hargrave
Tom Hargrave
Cameron Hay
Nick Hindle
David Morgan
Alex Robertson
John Weller

FREE LEGAL ADVICE

Up to half an hour's free telephone advice per problem on legal aspects of IAP members' work in Information Technology, from solicitors in a top international law firm.

Does not include writing letters, or considering documents sent through the post.

Special rates quoted for IAP members on any kind of legal work.

**Call Mark Snelgrove
on 0115 950 0055,
at Browne Jacobson.**

The Director General writes

Well, this is it, I suppose. After waiting a thousand years we really are in the final run-up to the millennium.

One last mad rush to fix clients' systems: one last chance to make astronomical amounts of money for doing nothing very much. Here in the IAP office we hear ever more ludicrous rumours about members' earnings and anticipated earnings. Good luck to you all – long may it last! Though I suspect a lot of people will find themselves suffering from a financial "morning after" in not much over a year's time. That's if you've survived the planes dropping from the sky, killer washing machines running amok, etc., that the chattering classes of Ealing assure me are programmed to occur.

By comparison things at IAP HQ have been undramatic. Astronomical amounts have not been earned; nevertheless progress continues to be made on a number of fronts. As you will read elsewhere, we have been able to extend the IAP's free telephone advice service to cover

accounting and taxation matters. Most of you will have read the article in last December's *IAPetus* by the accountants Wheawill & Sudworth. W&S already handle the accounts for some 600 independent IT contractors, so they understand the business.

Because the article was so well received, we have persuaded W&S to mount a free accounting advice service to mirror the IAP's free legal advice service for members. Even in these days of self assessment you may not need the advice of accountants or lawyers very often. But when you do it is jolly useful to have an expert immediately on tap, and not have to worry about the cost.

As the Editor has hinted some time back, we have been trying to introduce a new magazine. This could replace *IAPetus*, or it could run alongside. Frustratingly there is still no definite news to report, though we are in deep discussion with one or two potential publishers.

More positively, we have decided it is about time the Institution

reinstated its annual get-together for members, and this will be on Saturday, 18 September, 1999. Put this date in your diary *now*.

The venue, Trinity House, a historic mansion overlooking the Tower of London, will provide a most splendid setting. Few details of the programme are decided as yet, but it will differ from the conferences we have run in the past, with a greater emphasis on the social side.

We hope to provide an opportunity for members not only to meet one another, but to bring colleagues, friends and family for an enjoyable day, and to show them what the Institution is about. The plan is for the morning to be given over to talks, demonstrations and exhibits of a kind that will interest most people. Then follows a splendid lunch and an afternoon of relaxed chatting and more entertaining activities. Exactly what form these might take is still a secret, but I can tell you the President has been seen dusting off his saxophone.

Mike Ryan

An Introduction to the Application Framework

Talk to any developer on an Object Orientated project and they'll wax lyrical about frameworks; but what exactly is a framework?

Well, in this paper I'll explain what a framework in general, and an application framework in particular, actually is. I'll also outline what behaviours an application framework should encapsulate along with the benefits to the developer and the project in using one; and I'll end by exploring the idea of a corporate framework.

A framework is a collection of object orientated classes which collaborate to perform a specific task. The framework may implement one or more design patterns in order to achieve its goal.

For example a printing framework may contain classes such as Document, DocumentSelector, Printer, PrinterSelector and Medium. When working together the knowledge and behaviours

encapsulated within these classes allow a user to select a document and print it to a printer of their choice. These classes, then, would form a Printing framework.

In much the same way, an application framework is a collection of classes collaborating to form a set of knowledge and behaviours upon which application developers can build a software project. On a project, using an application framework, there will be two types of developer. The first will be the application developer whose job it is to take the user's requirements and turn them into the finished software product.

The second type of developer is the application framework developer. His job is to design and build a framework, which will encapsulate all the behaviour, and knowledge that is common across all business processes in the problem

domain. The application developer will then be able to use this framework to perform these tasks, thus freeing him to concentrate on the knowledge and behaviours specific to his particular business process.

Application frameworks, by their very nature, vary from project to project. However, most

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Tel: 0181- 567 2118, Fax: 0181-567 4379, e-mail: dg@iap.org.uk, Web site: <http://www.iap.org.uk>.

Herewith, the words of each of the candidates. Copies of these, and – when we have them! – photographs will go up on the website shortly.

Jim Bates

My own involvement in the computing and electronics industries began in the days of valve operated equipment. Nowadays I conduct research and development concerned with the examination and analysis of computer based material for both civil and criminal investigations.

I have been a Fellow of the Institution since 1987 and for the last few years have had the honour of being both President of the Institution and Chairman of the Governing Council. During my period in office I have seen many changes and the Institution has improved considerably, both in its public profile and in the services provided to members. I am anxious to continue to work for the I.A.P and its members and I ask you to elect me once again to the Council.

Ian Hargrave

I am proud to have served on the Council of the IAP for the last three years. During that time I have been instrumental in improving the financial records of the Institution and hopefully building a foundation for future growth. I believe that the Institution is now in far better financial health than it has ever been.

I would welcome the opportunity to serve another term of office with the aim to build further on the work the Council has already done. In particular I see three main goals which I believe the Institution should strive to accomplish over the next few years alongside the ongoing improvement of Services to Members, recruitment and general recognition within the industry. These are as follows: -

- 1) To identify a suitable premises within the UK into which the Institution Office can be moved with room for expansion and to set in place funding arrangements to allow the move to be accomplished within no more than a five year period.
- 2) To revamp the software used within the Institution Office so that it can run more efficiently.
- 3) To focus attention on obtaining a Royal Charter as I firmly believe that this is the single most influential action that could be taken for our members. All members of

the Institution would benefit from a greater recognition of the IAP and hence the initials they have earned after their name.

I appreciate that the above may not seem particularly glamorous objectives but I believe them nonetheless to be worthwhile and achievable. If you share this view then I would welcome your support.

Election Manifestos

Tom Hargrave

Graduating with an honours degree in computing and management, I have spent my whole career in the Information Technology industry. After completing a formal analysis training at Rolls-Royce Plc I worked for several years at the company gradually changing focus from main-frame to distributed technology. From Rolls-Royce I worked initially for a consultancy group before setting up my own company.

Over the past few years I have worked on a wide range of projects at the cutting edge of technology, performing consultancy for small businesses and multi-billion pound organisations both here and abroad. I believe in professional examinations and keep myself up to date with relevant qualifications and training.

The IT industry is a fast moving environment which is growing at an ever increasing rate. With the only constant being change, it can be a daunting and overwhelming arena with few organisations skilled and focused on overseeing and representing the industry's needs.

I would like to see the IAP become a globally recognised Institution bridging the gap between Analyst/Programmers and the market. I am confident that I can help achieve this by bringing to the Institution an industry focused perspective from the 'front line'. I want to help increase the awareness of the IAP with industry naturally turning to us as a skilled pool of knowledge. I also would like to assist the IAP in providing its members with industry focused information, keeping all informed as to the trends in hardware, software and technologies. As

these objectives are achieved I aim to help ensure that the IAP does not suffer from 'cobbler's shoes' syndrome with its internal systems and Internet presence.

Cameron Hay

A profession worthy of respect – During my 25 year career in IT in various roles of teaching, consultancy, analysis and design I have focused on methods, standards and on using a pragmatic but disciplined approach to development. I believe this is key, as a profession we need to communicate our intentions to the client and to analysts and developers alike in a common language. It is difficult but it is attainable.

As a profession seeking recognition and respect we must endeavour to demonstrate our ability to control the complete life-cycle and earn authority throughout our respective fields of operation. I believe the Institute is one of the most appropriate bodies to pursue that campaign.

Launching products and services – I have launched two quite different start-up companies providing software products and services. This has given me a detailed insight into venture capitalists and the difficulties and pitfalls of launching. At a practical level I would be happy to share that background and experience with those members that have aspirations of braving it and setting up their own companies and launching new products onto the market.

Nick Hindle

Nick Hindle was born in Sheffield, England in 1959, and currently lives in Hertfordshire. He is married with two children. After identifying the need to belong to a suitable professional body, Nick joined the Institution of Analysts and Programmers three years ago.

His first job in Information Technology was as a YTS computer literacy instructor in 1982, where he became the group IT co-ordinator. Two years later he moved to software development for a number of Insurance and Financial institutions.

Nick turned to freelance IT contracting in 1995, allowing him to continue specialising in software development techniques and acquire a greater knowledge of IT tools and their application in a variety of industries.

If elected, Nick would like to continue the promotion of the awareness of the Institution in the industry, and

investigate the introduction of Institution-approved certification in specialised skills and products.

David Morgan

I have been a council member since being co-opted in 1997. I am standing again for re-election because I believe that I can help the council in its work of running the Institution and trying to improve the benefits it gives its members.

I feel it is important that all members of our profession have a body which represents their interests. The Institution is always looking to the future and I want to be involved in shaping that future. I want to see the Institution grow and become widely recognised as the leading organisation representing analysts and programmers.

I am currently working, as a contractor, for British Gas in Staines on their Electricity Billing System. I have been there since November 1997 starting as a Business Analyst and now working as a Test Coordinator. This is probably the most intense IT environment I have worked in. Previously my IT skills were used to support my work in Community Development and Social Planning and to support other team members on overseas projects.

I have travelled widely in devel-

oping countries and have been amazed at the enthusiasm with which IT skills are grabbed. I look forward to the day when the Institution opens its first branch in India. But before that I hope to see our membership in this country grow until we can rival other professional bodies in size.

Alex Robertson

I have had the privilege and responsibility of serving as a Council Member and Deputy President of the Institution, since it was incorporated some six years ago.

Key developments that I have been responsible for in the past three years include getting the Privy Council office to recognise that we have a potential claim towards Chartered Status and the introduction and development of the IAP website – including the facility for members to have email addresses @iap.org.uk redirected to their own mailboxes wherever they may be.

My particular continuing interests in the Institution's development are to progress the moves towards Chartered Status, to develop the website to provide a service to all members and potential members and to ensure that the Institution remains the leading professional body in the world for Programmers and Analysts.

I also serve as an elected member of the British Computer Society's Council and am therefore in an unique position to represent the interests of the IAP there, and to ensure that, where possible and appropriate, both organisations are "pulling in the same direction".

John Weller

I am 55 years of age and live in Wiltshire with my wife. I was a navigator in the RAF for 33 years during which I qualified as the equivalent of a test pilot. I taught at the RAF College, worked with the manufacturer on the Tornado simulator development and subsequently tested the Tornado weapon aiming software at an experimental establishment. Whilst in the RAF I started an Open University degree in Computer Science and Applied Maths which I finished last year.

I left the RAF 5 years ago and became a contractor specialising in PC based database systems using Microsoft FoxPro. I have worked in the Life and Pensions field and am currently in the Foreign Exchange department of a major City investment bank. I believe the services that the Institution offers to its members are of great benefit and if elected would seek to enhance and expand them.

A Brief Look at Copy Protection

For developers that write applications for anything other than the mass market, a pertinent issue is that of software piracy, where returns on investment must be made from a limited or specialist market.

Many years ago, even large software houses employed copy protection for products that were aimed at the mass market. Few mass market products use some form of copy protection these days – AutoCAD being one exception that comes to mind. Some products require a license or serial number to be entered during installation, but this does not prevent the product from being used outside the scope of its license.

Although I will not attempt to cover the arguments for and against its use, copy protection can go a long way to ensure that your products will have some defence against the average software pirate.

There are several tactics that

can be employed, either alone or in combinations, to good effect. The main ones include:

- Use of devices
- Software 'burn in' of machine details
- Software 'burn in' of user details

The strategy used will depend upon the product, the end users, the scope of the licensing agreement, the distribution media and the target platform.

Devices

One key question is; Should the original media be allowed to be copied, so that a 'fresh' installation can be carried out from the backup? This consideration has been complicated in recent years with a proliferation of software distributed on CD ROM, so that in these cases, the installation process is prevented from writing to the distribution media.

If a limited number of installations are allowed, then obviously

this has to be tracked by writing the number of times the product has been installed back to the original media. If backed up media could be copied so that it was exactly the same as the original, this 'limited installations' policy can be circumvented. This is also pertinent to 'key disks', disks that can be checked at installation and/or when the installed application is executed, to ensure that the original media is present. Therefore, copy protecting the original media (i.e. making it a copy protection device) may be a key tactic in protecting your software. The methods used in this protection include:

- Non standard formatting of media
- Creating signatures that are difficult to reproduce

Although both methods could arguably come under one heading, I will tackle them separately.

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IAP introduces a new free service for members

Free accounting advice line

In response to an increasing demand from members since the introduction of Self Assessment, the Institution has extended its free telephone hotline service to include accounting and taxation matters. This service is being provided for the Institution by a London firm of accountants, Wheawill & Sudworth (W&S for short), who not only have specialised experience in the IT contracting sector but the spe-

cialised resources to handle any kind of accounting or taxation problem.

As with our legal advice line, the new service provides free telephone advice from a qualified accountant for up to half an hour per problem. It covers every aspect of accounting and taxation which members might come across in the course of their work as IT professionals. Members who need a little more than free advice

will find W&S have a wide range of keenly priced services specially tailored to the interests of IT professionals.

Three of the W&S Partners have volunteered to field members' initial enquiries. The front runner is **Iain Ferrie**, who spends most of his time on the affairs of W&S's 600 existing computer contractor clients. If Iain is unavailable, **Gordon Morrison** or **Richard Haynes** will step into the breach.

Call **Iain Ferrie** any time during business hours on: **0171 730 8995**

'Are you selling yourself short?'

All of us sell, and therefore bargain with, our services in some sense or other. Many IAP members do so overtly when negotiating a contract, for instance. Others simply do a little light salary haggling as a kind of rite of spring.

Lots of us do it implicitly by changing jobs. But how many of us have ever had any formal training in negotiation to help avoid the pitfalls? Pretty few, I'd guess. It's not the sort of thing that looms large alongside object-oriented programming and relational database structures in the majority of computing courses. And yet, if you were to undersell yourself consistently by just 10% throughout a working lifetime, you would have let slip through your fingers enough to purchase a decent house!

We all know, though, that it's

not as easy as thinking of a number and adding 10% to it. Overselling is just as dangerous as underselling – more so, since it can easily lead to no employment at all! And, of course, that's exactly why people tend to undersell themselves.

So how do you walk the tightrope successfully? The IAP, in conjunction with NRI (Negotiation Resource International), has developed a one-day course called "Negotiating a Better Fee" that's designed to help. It's not 'chalk and talk'. It's an interactive workshop, so you'll be able to try out the ideas presented in a risk-free environment. It deals with issues such as added value, preparation and planning, telephone negotiation, aspects of communication psychology and so on. This course will first be offered on 29 June in central London. The exact venue is to be announced. The full cost (ex VAT) will be £295, but IAP members qualify for a discount of £40. Places are restricted because of the workshop nature of the course and it's first come first served, so contact me soon for further information or to reserve a place. By the way, if you're an Associate Member thinking about applying to upgrade to Member, you should know that this course will give you 5 of the 50 Business points that you'll need.

Robin Jones
Education Officer

E-mail me at eo@iap.org.uk

Placements for Students

We continue to receive pleas from students seeking short term placements where they can get some initial exposure to real life in the IT business.

I know it is a dreadful bore having to stop what you're doing to explain it all in words of one syllable, but everyone has to learn some time. I will always be grateful to the brave men who stood back and let me, a complete idiot, design my first railway bridge. As it turned out, my talents did not lie in that direction, nevertheless what I learned in those five short weeks of the summer break has proved extraordinarily useful ever since.

As mature professionals I believe we have a responsibility to help able newcomers establish a foothold in our industry. But this can also pay unexpected dividends. Some students turn out to have real talent, and I can think of more than one managing director who first entered his company's doors as a spotty student on job-experience.

In many cases students are willing to work without pay. Even unpaid work looks better on your CV than a blank space! But being often hard up, students appreciate help with fares, or living costs if they are away from home.

If you or your company would be prepared to consider having a student for a short period, please let us know, and next time we get a request we may give you a call (without obligation of course).

Mike Ryan

GOING FOR A JOB?

Belonging to the IAP improves your chances of landing that new job.

Let us have details of any job application which you are making, and – without making any reference to you – we will brief your potential employer on the IAP and the importance of IAP membership as an endorsement of members' qualifications and standing in the profession.

Call Mike Ryan or Nicole Edwards on
0181 567 2118 or fax 0181 567 4379

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Non standard formatting employs a change to the normal format parameters of a disk – sectors, tracks and sides. An example would be changing the number or numbering of sectors. Most standard disk duplication utilities would have difficulty in reproducing the non standard format and during installation a check would be made on the format parameters to determine if it is an original or duplicated disk. In his book, *The New Peter Norton Programmers Guide To The IBM PC & PS/2*, Peter Norton states that the “most exotic and unbreakable protection schemes have been based on the discovery of undocumented abilities hidden in the diskette-drive controller”.

Creation of signatures can take many forms. A simple case would be that of using the disk's serial number – a number that is automatically generated when the disk is formatted (depending on operating system). Another example would be to create one or more bad sectors, either programatically, or physically such as creating a hole in the disk. Again the installation program would check to see if the signature is present before allowing installation or application execution.

Programs that are designed to copy a disk bit by bit (bit copiers) may overcome non standard formatting and programatically introduced signatures, but can never copy a hole!

Another approach is not to be concerned if the program has been installed before, or indeed how many machines it has been installed to, but rather concentrate on the user being a legitimate one. This is done using a device, similar in principle to a key disk, that is checked either when the application is executed or one or more times while the application is running. Where a key disk could be compromised by systems that employ disk caches, a device that plugs into either a parallel or serial port (often called a ‘dongle’) is unaffected and further more does not suffer from the inconvenience of having to have a disk present in the drive. The dongle can be transparent to other devices using the same port such as printers and scanners etc.

A similar idea has been employed by producers of games using the documentation as a ‘key’. On execution, or during play, the game may require a word or phrase from

the program documentation to be typed in. The documentation is often presented in a form that is difficult to photocopy, thus ensuring that even if the program could be copied, the documentation and therefore the key remains with the bonefide user.

Other software may require the presence of an ‘expansion card’ fitted to the computer, but by and large this is usually because the card has other functions other than copy protection.

Software ‘burn in’

This can be carried out either to tie the software to the machine, to the user or both. Locking the software to a machine means identifying a unique signature for that particular machine either using hardware, software or both. This could include details of disks, CPU, BIOS etc., recording such information as serial numbers, dates, versions and operating parameters. The installation process could also create its own software signatures using techniques such as creation of hidden files and directories or attaching a signature to files that are independent of your software but required by the system. Altering the content of such files is not advisable because of antivirus software, but there is space unoccupied by most files between the end of the file and the end of the last cluster, and leaving a signature there is less risky.

Another technique is to create a file in the root directory and set its attributes to system, hidden, read only and record its position on the disk. This type of file is unlikely to be moved by defrag utilities and by giving it an appropriate name, it can be camouflaged from prying eyes. By only allowing a valid installation process to create these signatures and limiting user control of the application only once these have been verified, gets around the problem of users backing up installed applications and restoring them to another machine.

There are many problems with this approach in that users may need to upgrade their machine and thus will need to uninstall the software (and its associated data) so that it can be reinstalled on the new machine. Other utilities may record all files that are installed and allow pirates to backup files that are not obviously associated with the application. The use of location specific ‘signatures’ will overcome this problem. The signatures can be kept in a data file

or ‘burnt in’ to the application executable file.

‘Burning in’ signatures into executable files can be done by using a ‘marker string’ – a string constant that is given a recognisable value and that can be searched for within the compiled file during the installation. Any signatures can be written to the area occupied by the string, without fear of damage to the executable code. Functions are written that can examine this marker string and return the signatures within it. The security can be further enhanced by encrypting any burnt in data, so that prying eyes will not easily recognise signatures within the file. In fact encryption techniques can be applied to the whole executable file, which is decrypted when required by the use of a ‘start-up program’.

A simple deterrent can be effective with some application software – using the ‘burnt in’ users name on any reports. An example would be in an accounts package, where the registered user's name is printed on the profit and loss account, balance sheet and budgets etc. A businessperson would not consider giving these reports to the accountant, bank manager or solicitor with another company's name printed on them!

This is by no means a comprehensive coverage of the tactics that can be used against pirates nor can it be stated that all these techniques will work with every operating system. It is further complicated with the trend to deploy applications via the Internet.

After you have written your ‘killer app’ you may be so tired that you may not want to face the prospect of writing copy protection routines into your application and installation software. No problem! There are many products available that can be used for protection, without you having to change one line of code. These solutions will often ‘wrap’ themselves around your executable and do the necessary checking before allowing your application to run. The same products can sometimes also be used to ‘time limit’ your products so that your end users can ‘try before they buy’!

Finally, to quote Peter Norton again, “variety and ingenuity are the keys to successful copy protection”.

Peter Norton & Richard Wilton, *The New Peter Norton Programmers Guide To The IBM PC & PS/2*, Microsoft Press.

Paul Lynham

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will encapsulate some or all of the following knowledge and behaviour.

The project's common look and feel will be contained within the application framework. By common look and feel I refer to the fact that button labelling, fonts, icons, actions to events etc, should be common throughout the product. This leads to reduced training time for the user because an unknown part of the product should work in the same way as another, known, part.

The application framework will also encapsulate the serialisation of objects. Serialisation of objects is the way in which objects become persistent; this may involve writing out each object to a file on the user's hard disk or, more commonly, it may involve breaking the object down and storing the object's internal structure in a RDBMS or OODBMS. Delta management should also be the responsibility of the application framework. The classes that implement delta management are responsible for deciding when the changes held in the windows are flushed back to the model object, of which the window is a view.

The application framework will also handle Instantiating new objects from the serialisation mechanism. When instantiating objects in response to a user request, the framework will decide which

objects to instantiate from the serialisation mechanism and which objects to substitute proxy classes for. These proxy classes would then be instantiated themselves as a result of further requests from the user.

So, now that we know what an application framework is and we've looked a little at what it should contain, when should we actually code the framework? Ideally this should be done when all the project requirements are known, but before any production code is cut. This, of course, should not impact the project timeline as this can be accomplished whilst the detailed application design is being carried out.

However, this is not always possible and it maybe that the application developers are forced to start coding before the framework is ready. It may also be the case that the project manager wants to retrofit a framework to a project that has already begun. Although this is not ideal it is possible. If this is going to be attempted it should be done as a task on the plan in it's own right and should be carried out between iterations of the development cycle. Naturally any testing which has been concluded for that product will have to be redone.

So, why bother with an application framework? Well, the answer to that question depends on who you are really. As a developer the benefits of a framework are many fold. The framework takes away the tedium of common tasks such as object serialisation. Not only does it take it way but it hides any complexity involved in the task. As a developer you tell the model object to serialise itself and it does. You don't care how it does it you just know that it does.

With this tedium removed from the application developer he is then free to concentrate on the business rules, design decisions, workflow etc, of his specific business process.

The developer also benefits from the "write once use many times" nature of the framework. The framework developer has written the object serialisation code and the application developer can call that code from anywhere within the software product where that object is reachable. The project as a whole benefits from the use of the framework aswell. The fact that the whole application is based on a tried and

tested framework aids quality assurance and cuts down on the amount of testing required. Frameworks, or parts thereof, can be moved from project to project, thus the next project will benefit not only from tried and tested code but from the fact that lessons learned from previous projects will now be encapsulated into the framework that they are using, thus leveraging the knowledge onto the new project.

Finally, I'd like to end by introducing the concept of a corporate framework. If a project has developed an application framework that they have found to be of great help during the development process then that framework maybe abstracted to an extent that it could become the corporate framework.

The idea is that a generic corporate framework exists and when a new project comes along then a member of the corporate framework team installs the framework in the new development environment. The developer would then enhance the framework with any project specific behaviour required before application coding begins. Obviously the more standardised the corporation is in it's development the more the benefits of such a framework are. For example if a corporation had a standard look and feel for their GUIs and standardised on Oracle as their database then those parts of the framework will not require re work from project to project.

However, even if this was not the case, separate sub frameworks can be developed for differing look and feels and differing database requirements and those sub frameworks can then be plugged into the main application framework. Over a period of time the corporation builds a library of reusable sub frameworks until a time when that part of the business has been modelled entirely. At this stage the corporation really starts to gain productivity enhancements from the use of tried and tested code. The benefits are realised in improved quality assurance and faster time to market for new products, both of which free up valuable resources for other business critical activities.

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