

IAPetus



Quarterly Bulletin For the Institution of Analysts & Programmers

Issue 4 December '92

Quarterly Survey

Starting with this issue of *IAPetus*, the Institution will be canvassing its members regularly on a range of topics about which you, as a professional analyst or programmer, can be expected to have an informed opinion.

The primary purpose of this exercise is to provide material that can be used to secure for the Institution a higher profile in the technical and professional press. However, it is also our ambition to develop the Institution into a body that industry and government will listen to and take notice of.

Hence our beginning to take some measure of the feeling of the membership.

Our first topic is a timely one. On 3 January 1993, a

whole set of new health and safety regulations come into force throughout the EC. While there is nothing revolutionary about the new regulations, which deal with the employer's responsibility for the health and safety of users, it is perhaps not a bad time to draw attention to these aspects of working with computers.

Curled up in its armchair, the Editor writes "If you don't fill it in, nobody will know what you think, what you care about. So send the card back today, before you forget or your cat runs off with it!"



A New Branch in the North?

George Henderson proposes that IAP members in the Tyne and Wear, Durham and Northumberland areas get together at some ale house – possibly in Newcastle – to discuss the possibility of forming a branch.

All interested should contact George at 10 Tanfield Gardens, South Shields, Tyne and Wear NE34 7DY, or call 091 455 5047. Let *IAPetus* know how matters progress.

Meanwhile, those of you in

the South Bedfordshire/North Hertfordshire area should contact M.D. Millward on 0707 333866 ext. 210 between 8 am and 6 pm any weekday, as he would like to start a local branch down there.

Londoners can try calling Dr. James Elliott on 081 577 1733 – he unwisely said to me at the Conference that he would be interested in organising meetings, and can offer a place for a proper talk within reeling distance of a pub!

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A year has gone by. This time last year, my IAP diary arrived and the newsletter said "Let's start a proper journal". I rather foolishly rang Michael Ryan and said "What a good idea". Well, I have enjoyed producing *IAPetus*, and hopefully you have all enjoyed the results.

Next year let's see some more of you in print. There will be another Conference, so come along - this year's was great fun. Give your support to anyone starting up a branch in your area, and if nobody is, start one yourself (and tell us about it).

God's blessing on you all for Christmas and the New Year, which I trust will be happy and prosperous.

Megan C. Robertson

Subscriptions for 1993

Subscription rates are increased from 1992 to take account of inflation and the increasing level of activity and investment in services to members. Rates have also had to take account of the Institution's new grading structure which comes into effect on 1st January 1993. Subscription rates for 1993 are:-

Companion	£57.00
Fellow	£51.00
Member	£45.00
Associate Member	£39.00
Student	£33.00

Anyone who was a Graduate or a Licentiate under the old grading system will in future pay at the Associate Member rate. We are writing individual letters to all those affected by this change.

Most UK members can save £5.00 off the rates given above by joining the Institution's scheme for payment by direct debit. More than half our UK members have already taken advantage of this concession. Forms may be obtained from the Secretary.

Standing Orders in Arrears

During 1992 we wrote to a number of members whose standing orders had remained unchanged since 1988 and who were still paying subscriptions of £16.00 or less. Many of these took advantage of our offer to largely write off their arrears provided they would transfer to paying by direct debit. But others have ignored our letter. From January we shall start to cut these people off the mailing list without further notice, and their membership of the Institution will cease. This is the final warning.

Members who set up standing orders more recently should appreciate that they will need to adjust them every year in future if they, too, are not to slip into arrears. This problem does not arise with direct debits, which allow for variable amounts to be drawn.

The Director General Writes...

So we have made it to the end of another year! Staff are resting, panting, on their oars for a brief break over the Christmas and New Year hols, before they rejoin battle with the rising flood of Institution activity in 1993.

Several milestones have been achieved in 1992. In January we began what has proved to be a remarkably smooth introduction of the direct debit scheme, thanks to our good friends at ACTive Business Services who do all the hard work for us. This should be a great time-saver in future years, freeing up our own staff to concentrate on more productive matters.

Then in June we published the first Directory to come straight out of the Institution's database. Not only did this save money, but, for a change, we suffered virtually no errors or complaints!

In October we had the Conference, reported in more detail elsewhere. While this initial effort was a modest one, it was a success, and provided important feedback that will be useful in planning future events. Many thanks to all those who helped.

With this issue of *IAPetus* we are enclosing a questionnaire, the results of which will be published in the computer press, and so help in our continuing campaign to raise the Institution's public profile. Another important advance in this respect has been the formal registration of the Institution of Analysts and Programmers as a company limited by guarantee. Not only is this a significant step for the prestige of the Institution, but it opens the way for members to participate fully in policy-making and management. More of this soon.

During 1992 some 700 new members joined the Institution. Some resigned due to retirement or changing career patterns but this still leaves a healthy increase, a trend which is likely to accelerate in 1993 and beyond.

One of the pleasures of my job has been to receive the many kind letters of encouragement and appreciation that you have sent during the year. I have also had the opportunity to meet members, at the Conference and at our Ealing offices where we receive an increasing number of callers, often members from overseas.

I know that 1992 has not been a good year for everyone, but there do seem to be some green shoots now in the IT business. Let us hope that a peaceful Christmas is followed this time by a truly prosperous New Year for us all.

Michael C. Ryan
Director General

20,000th Member Joins IAP?

Yes, it is true that member number 20,000 joined the Institution in October. It is not true that the IAP has or has ever had 20,000 members.

The confusion arises due to the late Bob Charles' "chaos theory" approach to numbering. His first numbers contained subtly hidden messages such as a member's date of joining, social security number or hat size. Later this scheme was abandoned and replaced with one intended to show whether a member lived in Trinidad or Malta. Unfortunately he failed to allow enough numbers so this master plan also had to be scrapped.

Under the present system members are merely allocated numbers in simple order as they join. This is essential to allow us to distinguish between those who share not only surnames but first names and initials as well.

Member number 20,000 is Dr. Igor Shagaev, who lives in Moscow. Dr. Shagaev is an authority on computer system reliability, and is Head of the Fault Tolerant Computing Department at the Smolensk Design Bureau of Cybernetic Systems. He was elected a Fellow of the Institution.

The "Edward Green" Chain Letter

During the autumn some of you will have received a copy of the "Edward Green Letter", a chain letter that has been the subject of some comment in the press. Two members have complained that they received copies from someone whose only connection with them was that all three of their names appeared in the Institution's membership list.

On investigation it appears that the person who circulated the letter is NOT a member of this Institution, and is therefore not bound by the standards of conduct expected of a member. But he got hold of our list because the member whose property it was did not take proper care to protect it.

This particular incident has probably done no great harm, but members who allow their personal details to be published for the benefit of fellow professionals do not want to become targets for the purveyors of junk mail.

Members are reminded, therefore, that the Institution's membership list is a document of great commercial value, which should

Dear IAPetus,

I wish to comment on a letter published in Issue 3 from Major G.C.K Taylor FIAP BSc with regard to membership and grading. I agree with the majority of his letter and I am pleased to see that the Council members have listened to the membership in modifying the structure of the Institution. I would, however, like to draw your attention to the latter part of his letter which states that "The role of the analyst or programmer is progressing from the 'bearded hack in the back room' to an engineer in his own right". Further on he considers the plaguing of the software industry by so called "computer experts".

My background of over eleven years in the computer industry is one of support and training. All too often I see reports in newspapers and computer related magazines which give the impression that if you work with computers you are a programmer. The computer industry is multi-faceted and as one of my colleagues regularly says "There's more to life than programming". With that in mind it might be an idea to carry items on training and support within the Bulletin. Emphasis on training has been steadily increased over the last few years, and I for one would be very interested to hear what people have to say with regards to the type of training that is now available to those of us in the industry.

The new buzzword at managerial levels that I am constantly questioned about is the so called "hybrid manager". Is there a definitive explanation for such a beast? Do they exist?

Yours sincerely

M. D. Millward FIAP

be guarded accordingly. It is not available for sale to the general public, but is provided freely to members in the expectation that they will look after it and use it properly.

[The Editor, whose copy of the "Edward Green" junk went straight into the bin, keeps her directory chained in a large vat of ice!]



I THINK WE'VE
HAD A HACKER

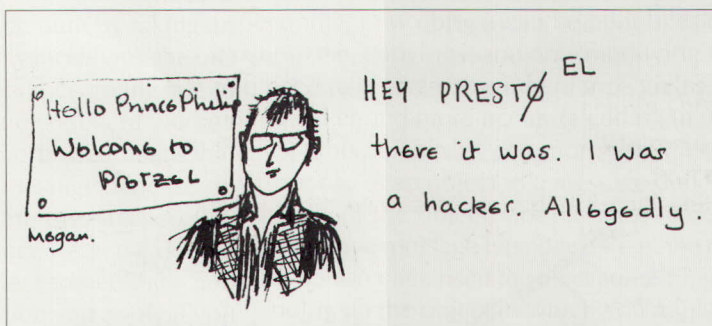
The 1st IAP

On 23rd October, the loyal and the bold – including 3 from Malta and one from Botswana – turned up at the City University for a day of varied talks and a chance to get to know one another. On arrival, each member was greeted by the Director General and other members of Institution staff, and provided with a goodie bag including a rather good book of mathematical puzzles. The talks were wide ranging, but all were entertaining and intelligible to all, irrespective of speciality (or, in other words, I could understand them!).

I shall attempt to present a thumbnail sketch of the various talks, if you want to know more the Institution has sets of papers available. Hopefully, the various speakers can be persuaded to write for *IAPetus* in the future too!

Opening address

The morning session began with the Director General's opening address, in which he claimed to have flooded the basement and set fire to the fuse box the last time he'd been there. The things engineering students get up to! He then handed over the chair to Alex Robertson, a senior member of the Institution, and the first speaker took the floor. Unfortunately Brian Lehany, who should have been there, had tonsillitis (from which we trust he has now recovered) and his place was taken at short notice by Robert Baptie, whose company wrote the software package used in Lehany's work. The project under discussion was one in which simulation and modelling was used in an analysis of the effects of stock control on holding costs, and



Baptie's talk showed how a generic modelling system can be used to build up a simulation of a given series of events and then variables manipulated and the effects reviewed. This is a lot quicker (and cheaper) than trying things out, yet enables the experts to air their views without having to learn how to run a computer as well as their stock room or whatever. If this sounds of use to you, contact Syspack on 0923 816486 for details of vs7, their visual interactive simulation.

The next speaker was Joe Pritchard who told us about Consultancy by Walking Around. Before your visions of Sir John Harvey-Jones take over, Pritchard has a better taste in ties and is involved in the concept of user-led development of computer systems, attempting to involve those who will actually use them in the specification, design and development of the system that is going to land on their desks or workbenches. The key point is that the user is already an expert in the job that he does, and the analysts' role is to help him do it better, or perhaps remove some of the overheads and drudgery from his workload. The consultant is an agent for change, who will assist the users to develop the methodology and skills to manage their own computer projects, creating an environment where users can play and learn without coming to harm, whilst avoiding paralysis by analysis.

A practiced presentation from Guy Martin, Languages Product Manager of Borland, then explained Object Orientated Programming, with reference to languages such as Borland's C++, designed to exploit these new (?) concepts to the full. The main aim of OOPs is to enhance the productivity of code developers, enabling them to both write better code to start with, and then to be able to reuse it more effectively the next time. This is all based around the three cornerstones of encapsulation, inheritance and polymorphism. These buzz words mean that firstly each "object" or chunk of process has its own properties (e.g. size, colour, functions performable upon it, etc.) encapsulated within it, where they can't be affected by outside influences, hence durable code.

Secondly, new objects can be built by taking an existing one, copying it and only modifying the bits you need to change, this inheritance giving rise to both quicker and more accurate coding (it worked the first time...). Thirdly, polymorphism means that the response of an object to a message depends on the nature of the object, not the message; so you can program a message type once – e.g. the double mouse button click used to select something – and depending on the object to which you apply it you will get a different response. As people write whole books on OOP, don't expect me to explain it in a few words... anyway, I think it's a state of mind which can be exploited by using the best language tools, but can be used to at least some advantage anywhere!

Escrow

The technical focus then changed, with a last minute addition to the programme, when John

Conference

Morris, a lawyer from the National Computing Centre, explained the meaning of escrow. He said that when he first arrived he'd spent several days trying to figure out what ESCROW stood for, the best offering being Electronic Source Code Retrieval Or What, before discovering that it's a mediaeval term for an agreement signed, sealed and delivered but not put into action until a specified triggering event occurs.

Today, it is used as a means to ensure the availability of software source code in the event of the writer thereof becoming insolvent or in some way breaking an agreement with those to whom he has sold licences to use his code. Many companies insist on this, especially from the smaller software houses. As an escrow agent, holding source code copies on behalf of various people, Morris explained some of the practical problems, such as the sheer volume (after all, code's no good without documentation), media degeneration, the updating of the stored source as the product develops and the interpretation of the triggering events that lead to the release of the code to an end-user.

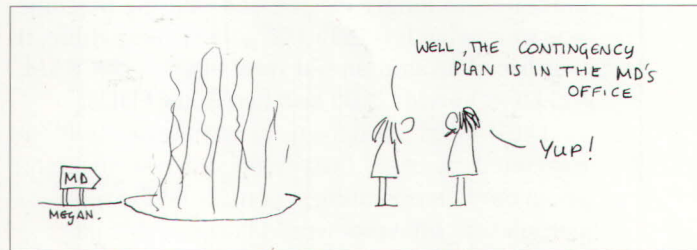
We all staggered off to lunch, in full agreement with John's closing words that "The law has always been a little strange". Well-fed and wine (Bob Shifreen and I found the orange juice and so stayed awake in the afternoon!) we returned... although the place is maze-like nobody got too lost... and were soon listening to Bob Shifreen, who began by announcing that he had laid in a supply of stale buns in case anybody dozed off.

Bob told a fascinating story of how (allegedly) he hacked Prestel, finding his way onto editing computers, into the depths of the network controllers and even into Prince Philip's mailbox! It seems that lax security left lists of passwords and IDs lying around where any inquisitive eye could fall upon them. Now poacher turned gamekeeper, Bob happily pointed out all the flaws that (allegedly) allowed him access.

Security

The security theme continued with Jim Bates, an expert in the murky world of computer viruses, and advisor to the Metropolitan Police Computer Crime Unit. The threat of the computer virus is real, but much less than the hype it receives would lead you to believe. If you have proper procedures to check EVERY disk that gets onto your system, and use them, there should not be any problem. Most of virus code is very badly written...if the average virus writer was a plumber we would have drowned long ago! However, one problem in the understanding and combating of the virus threat is

that nobody wants to own up to having been "got". Well, even if it makes you look rather silly, tell the police (Computer Crime Unit, 071-230-1177) – they won't tell everybody else, but it might help catch one of these rascals! [I have told my husband



that he will be divorced automatically if I catch him writing a virus! – Editor]

To remind us that not everything that goes wrong in your system is caused by some malicious toad, the next speaker Derek Oliver kept us on our toes with a talk on Disaster Recovery, which consists of having all your worst nightmares and then working out how to deal with them BEFORE they happen. A useful concept for life in general, and certainly for making sure that your computer system survives all that the slings and arrows of outrageous fortune can throw at it.

The final talk was entitled "What's in a contract anyway?", but rather than the legalese you might expect, Brian Crook of British Nuclear Fuels Ltd told us how the use of CASE tools and on-going quality assurance spread from being a requirement nobody understood to a way of life nobody could do without.

Finale

The afternoon ended with John Lamb of Computer Weekly talking about the future of the computer business and then chairing a panel discussion with several of the speakers....which included a brief bit of disaster simulation between Derek Oliver and me (poor dear doesn't know I've been roleplaying for years) in which he tried to convince me that a mythical file had been erased from an equally mythical but well-protected system in my absence (allegedly)!

All in all, a jolly good time was had by all, and it is now time to start thinking about next year! Those who came will be back, and those of you – the attendance represented approximately 1% of the membership – who didn't come should think about it, a day out in the company of fellow "computerites" with interesting talks and a chance to meet people.

See you?

Not anot

by Ted Pugh

Last month I was approached by a young entrepreneur bemoaning the fact that he couldn't get a simple accounts program for an old PC he'd had given to him. It turned out that the hardware manufacturer no longer existed and that the machine was somewhat less than 100% IBM compatible. It was based around an old Intel 8088, 128K RAM, MS-DOS Version 2.00 and two 360K FDDs.

"I just need something to get me started" he explained, "I know I really need a new machine and a modern operating system; but if the business doesn't take off, what would I do with it?"

Not long afterwards, as he sat before his machine (happily switching between process windows, input fields and launching multiple copies of the program's analysis module) he declared: "But they told me you couldn't get a copy of Windows for this machine."

"You can't" I replied.

"And this program will still work when I upgrade?"

"Sure – provided you stick to a PC."

"And plain DOS?"

"That's up to you. It'll work under OS/2, QuarterDeck's DeskView or MS Windows if you want. Just make sure you change that switch setting in your Desktop options from Weird ANSI.SYS to BIOS."

"This is magic" he said, reaching for his cheque book. "Are you sure that's all I owe you?"

"Mmm. Just make sure you give me a call when you need anything else."

"Oh, you can be sure of that...."

On Lies, Damned Lies and Advertisers

Well, maybe it wasn't quite so easy as that. I haven't told you about the problems with the ANSI.SYS driver that used non-standard command strings, nor about the peculiar keyboard arrangement and its strange keys – but these problems will be familiar to any bespoke programmer.

"there is no ready-made solution for the bespoke programmer"

To the casual observer, bespoke business software development has never been easier. In the computer press, thousands of advertising pages are devoted each month to language

libraries, system extensions, CASE and 4GL products – all apparently developed with one aim in mind: to make the programmer's task easier. If these reports are to be believed, application code can now be ported to any environment (using the advertised product) as easily as a racing driver changes the tyres on his car to meet the prevailing road and weather conditions.

XWindows, for example, appears a natural choice for business software development (there are versions available for its host UNIX system, the PC and the Mac); but this ignores the situation where clients specifically request an application to run under their current MS Windows or standard Apple Mac installation. An then there is OS/2 to be considered...

Products such as the XVT libraries from the American based Advanced Software Institute can provide a cost-effective solution to producing portable code across all four main GUI platforms; but even this solution is not ideal. Relying on any third-party software supplier inevitably means entrusting the client's data to someone else's code and also begs the question "What happens when yet another system has to be supported?"

There is another cost, of course: code size. Adrian Bailey's letter in the July issue of *IAPetus* eloquently summarised this point. One is easily led to the conclusion that a secret conspiracy exists between the major software producers and the hardware manufacturers to ensure we are all forced to upgrade our PCs on an annual basis.

Whether one believes the conspiracy theory or not, it remains a fact that serious business applications demand a great deal of data storage space, and it is equally true that implementing an advanced statistical analysis to supplement "what if" simulations needs to be undertaken in RAM if results are to be speedily supplied. Both these factors presuppose sufficient resources for implementing large file buffers to reduce the need for paging, and one way of ensuring this is to minimise the amount of overhead required by system code and data alike.

Meeting the Client's Need

I decided long ago that the only way to retain complete control over a software project was to minimise the use of third-party code and stay clear of any new system software versions until they had proved themselves in the market place. To this end I standardised my own production in a combination of ANSI C and low-level assembler –

her GUI!

developing and expanding my own personal libraries as the occasion demanded.

It was obvious to me then (as indeed it is now) that there is no ready-made solution for the bespoke programmer. Third-party software is readily available to solve specific porting problems but this inevitability means introducing a further code layer and compromising an application's functionality. The problem is that all these solutions are based on the premise that an existing product needs porting to a new environment – they do not directly address the bespoke programmer's problem of supporting any make of machine in the best possible way. Moreover, in a bespoke environment, final hardware choice is normally the last decision to be made – not the first.

Toolsmithing A Bespoke Solution

When I first set out on the entrepreneurial path, little emphasis was being placed on GUIs or standard user interface design. In those days few users had access to a mechanical rodent and were happy to simply select a number from the screen's menu. (Things change quickly in this business!)

It wasn't long, however, before the benefits of a standard user interface library could be seen. I was using SSADM as the main analysis technique and needed an efficient means of generating a front-end for the completed system.

As I came into contact with small business clients, however, I was also looking for a better method of describing the user interface on paper. (Very few of my clients had been exposed to formal software design methods and I found myself spending too much time explaining the SSADM Dialogue Specifications.) What I needed was a means of providing a quick prototype of the proposed system that would run on an old PC and still be able to make use of this code in the finished product.

One thing was clear from the outset; if the library was to be of general use it needed to be built around my existing modules to minimise code size. These modules contained the routines necessary for implementing SSADM file-based data linkages and the four forms of generic data structure (stacks, queues, linked lists and trees).

I decided that I needed two internal stacks. One for the main menu-bar and the other for process windows. I had also been frustrated for some time by the inability to create separate process threads from DOS, so I decided to solve this problem at the same time. This gave rise to the need for a further

stack to hold active processes and their associated thread lists.

The menu-bar was to be an array of menu title structures, with each menu title holding a pointer to an array of menu options. These

options would logically map to each of the SSADM designed processes, so I decided to have each of these launched as a separate thread by the system. I could then allow the user to switch between process windows, launch multiple copies of a single process, and also provide the potential ability to have one or more background processes in operation if I tied a round-robin thread handler to the PC's timer interrupt.

Next came further object support: what would I need? Dialogues certainly – with the ability to parse pre-defined input types in real-time. (There is nothing more frustrating from a new user's point of view than to be allowed to enter a character in an input field only to have the program "beep" unceremoniously when the return key is pressed.) Fortunately, these routines had already been developed – so all I needed to do was to create a dialogue box and attach the required function to it.

In screen terms, a window is simply a box – and so is a dialogue. And so is a check-box, switch, button or any other type of object. So a window can contain a window that can contain a window... A simple linked-list, but this time handled recursively.

The design was virtually complete. All that I then required was an event manager that could be used by an active process to gather input. Since each screen object was to be recorded as just another form of window, mouse support proved no problem. The same held true for form handling – a parent window containing the object list could simply be passed to a high-level event handler – thereby automating the entire user-input process.

So What?

So it came as somewhat of a surprise that when the basic library passed beta-testing I found it only

“stay clear of any new system software versions until they had proved themselves in the market place”

Continued on next page

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introduced an overhead of around 32K on the PC. Thirty two kilobytes to provide full facilities for movable and re-sizable windows, unlimited process threads, dialogues, full international date support, check boxes, switches, buttons, pop-up, pull-down and tear-off menus, transparent hot-key, help and mouse support-plus the inherent ability to handle the creation, deletion and manipulation of generic stacks and linked-lists (an important requirement of any business application).

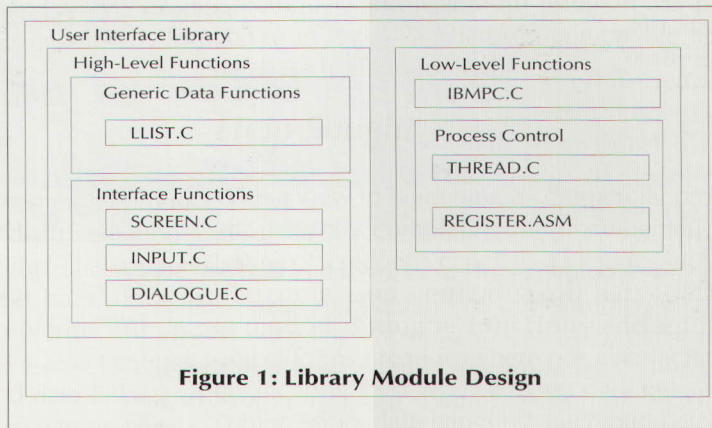


Figure 1: Library Module Design

But How Portable Is It?

Code portability was ensured by collecting together all machine specific code in three separate files. One containing the VDU manipulation functions, and the other two the code necessary to implement a system of process threads. This design is illustrated in Figure 1.

Because the system relies only upon common hardware primitive calls (moving a cursor, placing a character on the screen, reading a screen character and manipulating screen attributes) low level code can be quickly re-engineered to for any environment. (For my young client, this meant checking the PC's direct screen access address and conditionally replacing ROM BIOS calls for instructions to ANSI.SYS based on a global variable setting.)

Later on, I included graphics support by conditionally replacing text primitives with appropriately engineered function counterparts. This just required remapping the pixel-based screen in terms of the number of character positions available from the current font, and then responding to calls from the high-level code in these terms. Nothing could have been easier.

Sales Talk

My book "C User Interface Library" from Sigma Press (ISBN 185058 295 5) provides full details of the basic multithread interface design and its source code – both in text and disk form. It can be obtained from local book shops or readers can

obtain a copy from the publishers direct on 0625 531035 or FAX 0625 536 6800 (quoting a credit card number).

Any IAP member who would like to examine the basic MS C libraries (with full source code, test stub and 62 page text manual) can obtain a free copy by sending a 5¼ inch pre-formatted 360K disk (also with suitable return postage and packing) to myself at 337 Church Road, Thundersley, Benfleet, Essex SS7 3HJ. The files are supplied as a self-extracting archive and require about 754K of disk space. To use the libraries you will require an ANSI C compiler, and if you are using an MS product you're in luck – a Microsoft-compatible help-file database is also supplied.

Help Sought

With a view to launching a commercial product, I am presently completing the documentation and testing of a second version that includes support for horizontal and vertical scroll bars, data lists, extended dialogue functions and enhanced object/forms creation. There are also facilities for engineering SSADM disk based data linkages, file compression, data handling, encryption etc.

I would be interested in hearing from any members that might like to collaborate in extending the library's functionality – in particular anyone with experience in developing a 4GL front-end to automatically generate 3GL code. (The main library is written in a combination of C and assembler, but modules are available for adopting a MS mixed-language approach on the PC by using that company's BASIC, Pascal and Fortran compilers.) In a similar vein, I would also be interested in hearing from any members who would like to participate in alpha product testing.

The completed package will be aimed to assist development of business systems using SSADM and JSP techniques; but any feedback I can obtain to increase its overall appeal would be greatly appreciated.

IAPetus is the Quarterly Bulletin of the Institution of Analysts and Programmers.

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