



## The importance of forms

Dr Gibbs Myers made a telling statement a number of years ago when he said, "*Forms are a window through which you can look inside a business organisation.*"

With all the changes taking place and the exciting things happening with computers and other forms-related technology, it's easy to overlook the fact that forms still play an important part in the day-to-day operations of most organisations. Take away your forms and see how long you can keep going. I predict that most organisations would come to a grinding stop.

I've heard a lot of talk recently that we don't need forms any more. We can do everything "on the computer" so we don't need people to "design" forms—at least that's what the computer pundits predict. But these comments fail to address the real issues. They're one sided, concentrating on technology and forgetting that it's the human users that count. Just because the formatted entry of data is on a computer screen it doesn't follow that it isn't a form. I was hearing these same comments 30 years ago and history has shown that they were wrong. The image may be on a computer screen but the principles of information design still apply.

We must continue to drive form design with USER NEED, not technology or tradition. For example, Herman Hollerith patented his "Census Machine" in 1890 for the collection of data using punched cards. Photographs of Hollerith equipment can be found at the Early Office Machines" web site <[http://www.officemuseum.com/data\\_processing\\_machines.htm](http://www.officemuseum.com/data_processing_machines.htm)>. In the 1950's the modern business computer came into existence and I still remember the Leo II Computer in use where I worked in 1957. It was a crude machine, not doing much more than a modern day calculator and occupying a whole floor of the building where I worked in Sydney. Those first computers used punched paper cards to collect their data and to make sure that the holes were punched correctly, the paper forms from which the data was read were drawn with 80 numbered columns across the page.

The lesson? Well, programmers started placing little boxes and "combs" on forms and, even though we no longer have punched cards, we still design forms with the little boxes.

The computer set a new tradition—the idea that these mysterious beasts needed to be handled by "special" people and that their mysteries were indecipherable to the general public.

For far too long, form design has been driven by technology, but we MUST design for people first. As technology improves there is an increasing pressure to make use of it—technology for technology's sake.

## The move from paper forms to electronic forms

### 1960's to the present

The approach to electronic forms in the 1960's was indeed primitive. In 1969 employees of the Bank of New South Wales (later to become Westpac Banking Corporation, one of the world's largest retail banks) were told to prepare for change. By the mid-1970's there would be a paperless office and bank life would be very much different.

I remember in the mid-1970's lecturing on the subject and predicting that it wouldn't happen in the foreseeable future. It was obvious that many of the people who developed computer systems didn't understand their users. They didn't understand the way people worked. Just because programmers liked working with computers they thought everyone else would as well. But time has proved my predictions to be correct and there is still no semblance of a paperless office. In fact, statistics in one large Australian organisation showed that for each new computer, there was an additional cost of \$1000 per year for paper. There are many reasons for this, the main one being the poor quality of computer hardware and especially computer screens, which are rarely designed for ease of reading.

We're now at the crossroads. Technology is changing, although I can't see it changing fast enough for most of us to experience the totally "paperless office". But we will certainly see more and more use of electronic documents and, if they're designed properly, they should significantly reduce the amount of paper.

As well as electronic forms, electronic imaging and storage is now a reality. Pen computing now provides us with the ability to write on a small computer screen with a pen-like device and have the computer recognise the handwriting for conversion to editable data.

The earliest electronic forms involved filling out a form on a mainframe terminal and sending the data to a computer file or database. Other forms were produced as output from a mainframe computer and printed onto paper using a mechanical device such as a line printer, dot matrix, ink jet or laser printer.

1986 saw the production of forms on paper from a PC using a laser printer, but it wasn't till 1990 that electronic forms as we know them today started to appear. They were certainly crude, calling up a form graphic from a local library and printing a copy on a laser or other printer for manual completion. Some even provided the facility to fill them out on screen before printing.

It was a year later, in 1991, that real electronic forms appeared on the scene. These went even further, calling up a form from a local library, filling it out on screen and sending it via electronic mail to someone else. These forms could also be linked direct to databases.

## Towards 2000 and beyond

We now see forms being accessed from a remote library possibly on an internal wide area network (e.g. intranet) or internationally on the Internet. They can even include on-screen videos and "virtual reality".

High speed scanning of paper forms is now a reality and the technology to read handwriting is improving so rapidly that it is now feasible to enter data from a form directly into a database without keying. Of course, there is still a lot of room for improvement. There tends to be a high error rate with alphabetic characters, but it is still reliable enough to produce massive cost savings for many organisations.

One of the big advantages is the ability to read forms and make decisions about content automatically. As optical reading technology improves we'll see more and more use of this and a lot more automation.

But while scanning and handwriting technology will have an increasing impact on form design, the biggest impact right now is electronic forms and I predict that this technology will continue to improve with dramatic results.

## The real cost of forms

In 1950 the Hoover Commission reported that printing was only 4.4% of the total cost of business forms. The remaining 95.6% was storage, processing and other related activities.

In 1993 we estimated that printing cost had reduced to between 1% and 2% of the total cost due to advances in printing technology and a rapid rise in the cost of labour for clerical processing.

Today, we find a hidden cost in most organisations, that of error correction. It's commonplace to find 80% to 100% of public use forms wrongly filled out. Unfortunately, most organisations fail to realise the enormous burden of these errors, the cost to the public and the cost to the organisation itself in repairing those errors. In organisations such as insurance and finance companies, there is also the hidden burden of collecting bad data and providing insurance or other services to customers who aren't entitled to it or providing an inappropriate product.

As we move further into the twenty first century we need to realise that turning bad paper forms into electronic forms will not solve the problems. All that will do is make the problems happen a lot faster. For more information see our paper *Forms Perspective No.4* which is available from our web site <<http://www.rbainformationdesign.com.au>>.

## What is forms management?

Before we look at the future of forms management it's worth considering just what "forms management" entails.

Asking what it is may seem a strange question, but many companies claim to supply *forms management* systems and programs when all they are supplying is *inventory control*. This is way off the mark and for the purpose of this paper the subject is much broader.

On the other hand, many people look on *Forms Management* as just a means of

eliminating unnecessary or duplicated forms. They seem to believe that all they have to do to control forms is to conduct a short-term procedure study, cut out the forms that aren't needed, introduce a good stock control system and place an experienced senior clerk in charge. If this was all it took, forms would not be the problem that they are to business and government. Many organisations have tried this and failed miserably so it is quite clearly not the answer.

*Forms Management* is not just involved with **elimination** of paperwork; it also **creates** forms—forms that are needed by the organisation to conduct its business efficiently—forms that may not have even existed before. This is where *standards* become a very important part of a forms management program.

But the best form in the world, designed meticulously to high standards, is useless if it can't be obtained—if there aren't any in stock, or if its construction is so complicated that it will take a year to get it printed. Supply and stock control may not be **all** there is to forms management, but they are still important components.

Some of the forms management functions need to be administered by the Forms Management Department while others will only need to be controlled indirectly by it.

## The functions of Forms Management

For the purposes of this discussion, I have broken the functions down into three major categories and I'll deal with each in turn.

### 1. Analysis and design

This is the most important function and the one most overlooked. I don't mean that organisations don't have it, but it is regarded as just simple graphic design by many organisations and the function relegated to low-level staff. With the increasing interest in *process reengineering* and *forms automation (electronic forms)* the type of work undertaken by forms analysts is expanding rapidly. Analysis and design involves at least the following components.

#### Usage and workflow analysis

While this has always been a part of good form design and management, it is VITAL once you get into electronic forms and automated forms systems. It is essential for the form designers to get heavily involved in this process.

#### Design

This component shouldn't even need comment. All forms need design and its pretty much a waste of time controlling supply if what you send out doesn't work.

#### Standards and guidelines

This is an important aspect of good forms in a large organisation. *Standards* are those fixed rules that everyone must follow such as how to use the corporate logo. *Guidelines* cover general form design activity such as type to be used, line weights, screen densities, colors, etc. These issues become of extreme importance if you decide to decentralise any of the forms function.

## Testing and evaluation

To many people, this is just checking to see if there is enough fill space or carrying out opinion surveys and focus testing to see if people "like" the form. But modern testing and evaluation techniques are far more advanced. Today we use low-cost methods such as error analysis and structured observational useability studies to find out if the form REALLY works—and if not, to find out WHY people misunderstand how to use it. I believe this is *the most important part* of good forms analysis and one of the most valuable training tools.

## Specification writing

While part of supply or procurement, it is closely related to the design and should be carried out by people familiar with the form's function and design.

## Form review

This is an extension of analysis and design where you are able to use the form department's experience and skills to enhance forms on a planned basis.

## Analysis And Design — Predictions For The Future

### Software

As we go further into the 21st Century the workload on forms analysts and designers will become much greater. A lot of electronic forms software is relatively crude with most only having basic functionality. In many cases, the designer has to be a competent programmer just to get basic things done well. But this is changing rapidly with software such as Shana's Informed Quadra making the development of computer-based forms a relatively easy task.

There has been a lot of comment in recent times about the supposed need for form designers to be computer programmers—or at least have a thorough working knowledge of such applications as Visual Basic. Given the current state of technology, this claim is to be expected. But there should be no need for this concept to continue. I'm reminded of the early days of PostScript and the Apple Macintosh computer. The only drawing software available was Apple's MacDraw and that was very limited in functionality. The only word processing software was MacWrite; unless you wanted to use stand alone word processors such as the Olivetti machine that I used. We found a great program called "JustText". It was very basic but it allowed us to do all sorts of things with text and graphics that just weren't possible in the other programs. Everything had to be hard-coded and it took a while to learn how to do it, but the results were fantastic. However, as time went on, software improved. Companies such as Microsoft and Aldus produced "Word" and "PageMaker", and formatting text became much easier. Programs such as FreeHand, CricketDraw and PhotoShop dramatically improved drawing and the need for JustText to create the PostScript code for printing disappeared. More recently, the Internet saw the need for people to format pages using HTML and this is how we created our web site. It has all been hard-coded using HTML text in Microsoft Word. However, the need to do it this way is fast disappearing as programs such as Adobe GoLive, NetObjects Fusion and Macromedia Dreamweaver mean that the pages can be created using simple to use graphics software. Web pages can be created without the user having to understand a word of HTML. This web site was created using Dreamweaver.

When we come to forms, the issues are the same. The first real way to put well-formatted forms on the Internet so that they can be completed within a web browser was to use Java. But programming in Java is not for the faint-hearted. Electronic forms software is now available which can automatically create the Java form from the original drawing without the need for any special programming.

So what about the future? If form designers have to be competent in languages such as Visual Basic and JavaScript just to create good electronic forms, then design productivity will decrease to the point where electronic forms just aren't viable. But we're already seeing programs that automatically create electronic forms using HTML and XML without special programming. The point I want to make is that form designers shouldn't panic about the need to learn programming languages. History tells us that the need will only be short-lived. Since the original version of this paper in 1999, we've soon see the development of software that makes the design aspect simple, creating the JavaScript automatically and freeing up the designer to concentrate on the more important analytical components.

## Analysis

Even at the basic level, usage and workflow analysis will continue to be mandatory for electronic forms. This has always been an important part of forms analysis work but many organisations have insisted on cutting corners to "save" costs and just haven't carried out this vital activity. But with electronic forms, it can't be avoided unless you want a total disaster. Effective analysis is the most important part of electronic forms development. You can have the best software in the world but if you don't know how the user is to carry out the task, then how can you design effective forms? You can't even begin to add effective intelligence unless you know first what that intelligence has to do. And a final word on this issue—what is the point of designing electronic forms if you aren't going to make them "intelligent"? You might save the cost of preprinting stationery, but you will have overlooked the REAL benefit of electronic forms, the vast improvements in productivity and reduction of errors.

All this means that you will need to develop even better and more effective standards and guidelines for designers and form developers. They will have to go beyond just the traditional graphics to include a lot more guidance on how YOUR organisation wants forms to work. Of course, you should be careful not to make the standards too restrictive. Even with paper forms, I've always insisted on having "guidelines" for most situations rather than rigid "standards" that inhibit creativity and the effectiveness of the skilled designer. Likewise, with electronic forms, we still have a great deal to learn and shouldn't limit our designers with ideas based on our limited experience.

## Professionalism

I've become more and more concerned at the lack of professionalism in the forms world. Analysts and designers need to become even better at what they do. The more forms are designed by highly skilled forms professionals, then the faster they can be produced and the less end users will have to deal with poor design. My point is that if forms are designed by people who know what they're doing—by people who know how to make them collect data without errors—then the less time is spent overall in the design process. Rework drops dramatically.

With the need for more detailed forms analysis as we progress more and more into the

realm of electronic forms, we should see a significant increase in professionalism. My concern is that it will concentrate on computer programming rather than the needs of people.

## Testing

I've taught for many years that for forms to be truly effective, they **MUST** be tested. Not that testing will "guarantee" a form's success, but if carried out effectively, it **WILL** give you a high degree of confidence in your design. With the forms of the future—both paper and electronic—testing becomes even more valuable. Already we're seeing an increased demand for "quality forms", for forms that minimise errors and filling out time, for forms that **REDUCE** the burden on the form filler. There has been a lot of emphasis on "the paperwork burden" for many years, but it has concentrated on reducing sheets of paper and writing space, rather than reducing the form-filling burden. The emphasis is on **reducing** "paper" while **increasing** the "work". This has to stop if we are to truly benefit the community. The most effective way to improve forms is to test them thoroughly with modern scientific methods such as **observational studies**. There isn't the space to go into this here, but I've written extensively on it in other papers available on our company's web site <<http://www.rbainformationdesign.com.au>> and in a major section of my latest book, **Forms For People**. Electronic forms need even more thorough testing and we'll see a significant increase in this activity.

## Resources

As I said at the start of this section, the workload for forms people will increase dramatically over the next few years. Organisations will have to realise that if they want to make use of the new technologies, then they will have to allocate far more resources than they have been doing. I also believe that this will have to be carried out in-house. Outsourcing, at least in Australia, just isn't working for the forms and computer professions. There aren't sufficient skilled forms people around to do the job.

## 2. Supply

This is perhaps the most traditional aspect of forms management. Many organisations **ONLY** concentrate on the supply function, leaving the others untouched. It involves all those activities that are related to making up-to-date forms available to all the users.

### Procurement

All forms have to be purchased or printed in-house and someone should control the function. In many organisations this will be done by an area separate from the forms department, but there should still be a close working relationship. Irrespective of what normally happens, I have always been a strong advocate of the first print for of a new or significantly changed form being handled by the forms specialists.

### Checking printed forms

Obtaining forms doesn't stop when the order is placed. Someone needs to quality check the finished product **BEFORE** it is distributed to users. This is particularly important with machine-used forms. In a large organisation, it may be best to have a sample pack delivered direct to the forms management department for immediate checking.

## Storage, inventory and distribution

It has often been said that a bad form that is available is generally far better than a perfect form that is out of stock. This is another area that may be separate to the forms management department, but where there is still the need for a close working relationship.

## Forms Supply — Predictions For The Future

### Requests for instant change

Over the past ten years I've seen an increasing demand for instant change and my prediction is that this will only get worse. Twenty years ago, it took hours—and often days—to get a form changed. Drawing, preparing layouts, typesetting, paste-up and all the other pre-press matters took a lot of time. Today, we can do it so fast that most forms owners have forgotten what it used to be like. The trouble is that since so many things CAN be done instantly, forms users think that designers can do anything at all on demand. They "demand", you "jump".

We're going to see more and more the need to roll out new forms and modifications overnight. Add to this the increasing demand to reduce staffing levels and the problem becomes even worse. We may not like it, but I fear that we may just have to get used to it—or do we? What can we do about it?

One important step is to increase the awareness of the complexity of forms work and the issues surrounding human communication. Forms sponsors and management in general have to come to understand that forms are not just drawings or computer programs. As I've said many times in my writing, if forms were that simple they'd work—so why do so many people make mistakes? The answer of course is that forms aren't simple—information design is not "kid stuff". Forms analysis and design is a highly skilled profession and management needs to understand this. My experience has been that once they do understand it, they're more likely to plan ahead and not just leave the forms till the last minute.

### Print on demand

We're regularly seeing increased use of "print on demand" to replace preprinted paper forms. Electronic forms software is a simple way to achieve this and we'll see more and more of this approach over the next decade. While some of this demand is based on sound cost-saving analysis, much of it is simply a shift of cost from one area to another. It gives the appearance of saving costs while just diverting the expense from one bucket to another. Its greatest benefit is for low-usage forms, especially where they are held in stock by a large number of end-users. Instead of printing a supply of forms for each user when they are only needed occasionally, the user can simply print them from the computer as needed.

One of the most significant benefits I've seen in this regard is the use of print on demand by the Australian Navy. Naval vessels, and especially submarines, are away from base for long periods of time and need to carry large quantities of forms. Paper is heavy, so this adds significantly to the vessel's weight. In the case of submarines it also takes up a lot of valuable space. A lot of weight and space is saved by converting forms to electronic format and then just printing them as needed. By making them fully interactive and using electronic transmission, even the print paper can be saved, reducing weight and space needs even further.

But while there are benefits, there are also pitfalls that you need to be aware of. First, if the volume is high, then it could cost considerably more to print off a laser printer than to preprint the forms using the traditional offset process. Then there is the disadvantage that these forms generally have to be printed with black on white paper. In many cases, this won't be a problem, but the use of color can be an important factor in making forms easy to use and this advantage disappears with "print on demand". Of course, you could use a color printer, but for most organisations these are still too expensive and slow. We use a Canon printer in our company and it provides top quality output, even printing A3 or 11" x 17" duplex (double sided) automatically and collating the output if the form is multipage. We have a special need and can justify the cost, but for normal forms production this is still too costly and slow. However, the cost of desktop color printers is dropping significantly and they are getting much faster. At the current rate of progress, within the next five years we'll see low-cost desktop machines that work as fast and efficiently as today's black and white laser printers. When this happens, even color will no longer be an issue.

Forms managers need to be alert to the issues of "print on demand", making sure that user management is aware of the pitfalls and only uses it when it can really achieve cost savings and improved productivity.

## Records management

Finally, in this category, don't forget records management. When filled out paper forms are stored either in their original paper format or in some other format such as microfilm, they are easy to retrieve and read—even way off in the future. People who want to know about a particular document can see it just as it was when it was originally filled out. But electronic forms don't provide the same ease of access and security.

In thinking about where we might be in the future, just look back over the past 20 years or so and see how far technology has progressed in so short a time. Apple introduced its first personal computer in 1977 and IBM followed five years later in 1982. By 1984 the Apple Macintosh was born and a year later Microsoft introduced its Windows interface. The now popular Microsoft Windows 3.1 wasn't introduced till 1992 with Microsoft's first attempt at real PC ease of use being Windows 95. I started using a personal computer in 1985. It had the whole operating system as well as word processing and drawing software on a single 400k floppy disk. It had 256k RAM (in-built memory) and no hard drive. This year, just 18 years later, my new laptop computer has almost 20GB of hard disk space, 512MB RAM, a 24X speed CD/DVD drive, a 1024 x 768 pixel flat screen display and a super fast 500Mhz PowerPC processor. It's so fast that as I type this paper in Word X it automatically checks the grammar and spelling as I write, corrects my spelling if it knows where I commonly make mistakes, highlights any suspect errors on screen, saves my work automatically every few minutes—and all this in the background without slowing down what I'm doing. It also runs both Apple's Macintosh operating system and Microsoft's Windows 2000 Server simultaneously. We've come a long way in a short time and the rate of technological change gets faster and faster. So what about the future?

Imagine it's the year 2020 and because of some legal matter you need to access a form filled out electronically in 1999.

- To start with, will you even be able to read the form?
- Will you still have the software that created the form?

- If you have the 1999 software will it work with the 2020 operating system?
- If you stored the form on floppy disk or even a magnetic hard disk in 1999, will the technology to actually READ those disks still be around in 2020?
- Even if the technology's around, will the storage medium have lasted that long?
- Maybe you stored an archive copy of the forms on CD-ROM, but will you still be using CD-ROM's in 2020?
- Even if you have an old hard drive or CD-ROM drive, will it connect to a 2020 computer?
- Even if it connects physically, will the 2020 operating system allow it to work?
- Maybe you have the latest 2020 upgrade of the original 1999 software, but will it be able to read the form that was created in 1999?
- Maybe you'll be able to retrieve the data but will it appear the same as when the form was created? Maybe you think this isn't important, but will the electronic form be legally accepted if the representation of the data is different to when the form was originally filled out?

I've no doubt that you could go on and on with questions like these. The point is—can you answer them? Our forms management planning as we enter the 21st Century should be taking into account the rapid changes in technology and the fact that we are so heavily reliant on that technology. It's no longer a matter of relying on paper that can often be read no matter how old, faded and fragile it has become. One small glitch in the index of a computer disk and the whole disk can be unreadable.

### **3. Control**

This function cuts across both supply and forms analysis. While the first two involve practical day-to-day tasks within the department, the control function is the medium by which you can keep all the other matters in check. It generally includes the following functions.

#### **Job production**

This means keeping track of each job from when it arrives in the department to when the new form or change is fully implemented.

#### **New designs and changes**

These need special procedures to formalise their handling. In a small organisation this will be a minor task, but in a large organisation with thousands of forms, it must be controlled or you will have chaos.

#### **Form numbering and cataloguing**

Here is where so many forms management programs get far too complex and bog down in red tape. A good form numbering and cataloguing system is essential, but it only needs to be simple. A forms management department will have enough on their plate keeping up with producing good forms without having to worry about complex computer systems and their maintenance.

## Forms Control — Predictions For The Future

The introduction of electronic forms has caused many forms management people to question the validity of the current practices for the years ahead. On the surface, most of the control issues seem to be the same no matter what medium is used.

### Job production

Job production issues for electronic forms remain much the same as with paper forms, except for the increased work involved with analysis and testing. The main concern is that we allow sufficient time in our production schedules for these functions.

### New designs and changes

Handling new designs and changes for electronic forms shouldn't be much different to the way we do it with paper forms. The main consideration will be the impact of those changes on computer systems and programming and, especially, on how we will handle differing versions.

### Document management and version control

Form numbering and cataloguing becomes a slightly more difficult issue, especially where the form is in both paper and electronic formats. You'll probably find that a single form number for both won't suffice. This needs to be explained in more detail as people who are new to electronic forms often overlook it.

With new versions of paper forms, the form number can often remain the same no matter how great the changes and how often they occur. But with electronic forms you have a new problem to contend with. With normal electronic forms software, the form template or master graphic is a separate computer file to the data file. This means that when the form is sent electronically from one person to another, only the data has to be transmitted together with some tags to tell the recipient's computer where to place it in the form. This keeps the file size small while providing each user with a graphic representation of the form and all the "intelligence" that makes electronic forms so valuable. All this means that the data and the "form" are kept separate. (Now you could keep them together, but that would make huge computer files and take a lot of storage space as well as adding significantly to transmission time. Maybe, in the future, when memory and phone line technology has progressed way beyond what we have now, none of this will be a problem. But as we enter the first decade of the 21st Century, it is *STILL* a major difficulty for most forms users.)

So what is the problem? If the data and form are separate, then you have to be sure that the version of the form you are using has the data cells or fields to place the data in. What do you do if the new version of the form doesn't have a cell for an item of data on a form you completed with an earlier version? You will have to know which version was used and have access to it. If you just rely on the same form number with the possible addition of a version number, then you may be in a lot of trouble. Much depends on the software you are using. For example, with Shana's Informed you can allocate a traditional form number to the "Template Name" field, but have a separate "Unique ID" which can remain the same as long as there aren't any troublesome changes. Each change can have its own version number (e.g. 1, 2, 3, 4, etc.) but you can also change the Unique ID if there is a major alteration. That way, the standard Form Number can continue to be used while the actual ID of the form file can alter. If you wanted the "Template Name" to be a descriptive title

rather than the form number, then this wouldn't work and you would need to change the Form Number every time there was a major change in the form.

I've spent some time on the above issue because it's something that doesn't seem to be a problem to the novice. It's only when you're a year or two down the line that you realise the importance of proper document management and version control.

## Summary

As we journey into the 21st century my greatest concern is that we'll forget the past and continue to just let the world around us drive our actions rather than US taking charge.

As forms professionals we have a responsibility to take control of our work and make sure that the future generations have forms that are designed for people first. There's nothing wrong with technology. As I mentioned earlier in this paper I'm using the most powerful laptop computer in the world to write it and I don't know what I'd do without it. But I use this computer because it's an effective tool to get a job done, not just because it's there.

What happens with forms in the next few decades is up to us. Let's take control and make sure the mistakes of the past are not repeated.

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