FIFTHOCEAN
TECHNOLOGIES

MOVING AWAY FROM PAPER FORMS

Benefits, Challenges, Solutions

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INTRODUCTION

Paper forms have been, and continue to be a useful and necessary part of doing business for many individuals and organisations. They have provided a way to uniformly collect same or similar information, at a lower cost than doing so without their aid.

Especially where regulatory and/or legal considerations are present, forms constitute an integral part of many organisations' business processes.

Paper forms, however, are not without their downsides – many of which can be addressed by the adoption of electronic forms into any organisation's day-to-day operations.

This whitepaper will convey instructive, useful advice to start transitioning your organisation towards effective use of electronic forms. We will bring your attention to a comprehensive suite of strategies and pitfalls to make the transition as predictable and pain-free as possible.

THE COSTS OF PAPER FORMS

As many organisations experience today, paper forms introduce numerous pains of their own, which contribute to their cost significantly –potentially easily solved by the use of electronic forms.

AGEING

As business processes, operational and security requirements change, forms need to be updated with new fields, instructions and submission processes, amongst other things.

Once changes to a paper form are published, **old versions tend to linger uncontrollably.** This is usually due to third parties distributing photocopies of the old version, and/or re-hosting the electronic version on their website).

Not only does your organisation have to track down and stop the source of the outdated form, it is also responsible for ensuring that all submissions using the old form are handled appropriately.

HANDWRITING

Despite people's best efforts, and instructions to 'PRINT CLEARLY', **handwriting is often illegible.**

The receiving party to a submission is either forced to guess what the applicant meant to write, with the risks entailed therein, or treat the submission as incomplete, resulting in processing delays.

VALIDATION OF DATA

Paper forms can only influence how data is entered to a certain extent – usually via instructions and by providing character boxes for people to print into.

However, human judgement is hard to predict, especially in circumstances where the language barrier is a factor.

Improperly entered fields are common occurrences.

These may require follow-up by the stakeholder organisation and/or resubmission of the entire form – a lengthy process that can impact business outcomes significantly.

DATA RE-ENTRY

Many organisations process paper submissions manually - an individual sits at a computer and copies information from submissions into a backend system.

Especially when there is a large volume of forms to be processed, **transcription mistakes will happen** and are unlikely to go noticed once the information is in the system. Having to deal with these mistakes down the line is wasteful.

THE CURRENT STATE OF AFFAIRS

The Internet is the major platform upon which many, if not most modern business platforms have been built with and continue to be built upon.

In comparison to one or two decades ago, a far larger proportion of organisations now have a firmly established web presence. Alongside this increase, we observe a broad switch of preference by end users from doing their business offline to online.

BUSINESS HAS MOVED ONLINE

Many organisations (government, small, medium and large organisations) have successfully figured out how to make available, even if partially, their paper forms electronically in meaningful ways that net them significant benefits.

The processes of applying for licences, registering with an organisation, making claims and getting a quote have all been transformed by the use of electronic forms.

THE REST OF US

Not all organisations are created equal, and we understand that the way that your organisation does business is affected by an ever-growing set of influences and constraints.

Making the transition from paper to electronic forms is HARD.

THE GREAT DIVIDING BARRIER

We have identified many organisations, of all types, that are either unable to try, or have struggled and failed to bring their paper forms up to date with the rest of their online presence.

We've also identified the major causes of these struggles.

1. LACK OF DOMAIN KNOWLEDGE AND EXPERTISE

The overwhelming problem that underlies all others is that there is virtually **no existing knowledge base** available for organisations to consult for comprehensive information about moving to electronic forms.

Where this expertise is available, it does not come cheap – certainly inaccessible for small and medium organisations without significant discounts or sponsorship.

2. INABILITY TO PLAN AHEAD PROPERLY

Stemming from the last point, **it is very easy to underestimate the complexities** of the transition to electronic forms.

Analysis and planning really is half the battle – knowing all of your requirements intimately and structuring your transition to suit is a key part of preventing failures down the line.

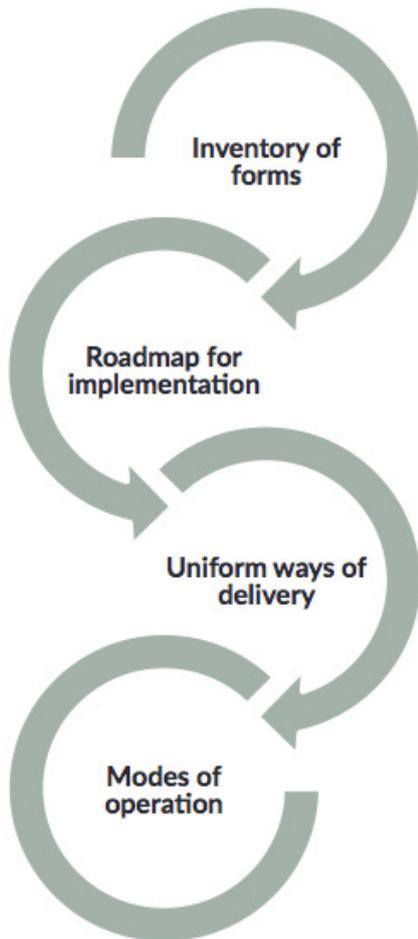## 3. PROHIBITIVE COSTS OF AVAILABLE E-FORMS PLATFORMS

For very large organisations with significant funding capability, integrated electronic forms platforms do exist – but with licencing, development and operational costs running into the hundreds of thousands, obvious difficulties arise.

SOLUTIONS

There are a core set of activities that we consider mandatory to follow for any organisation's guaranteed, successful adoption of electronic forms alongside its existing paper forms.

We have broken them down between two broad stages, consisting of those core activities:

ANALYSIS

- Inventory of forms
- Roadmap for implementation
- Uniform ways of delivery
- Modes of operation

IMPLEMENTATION

- Technological platform
- Implementation framework
- Project planning
- Execution
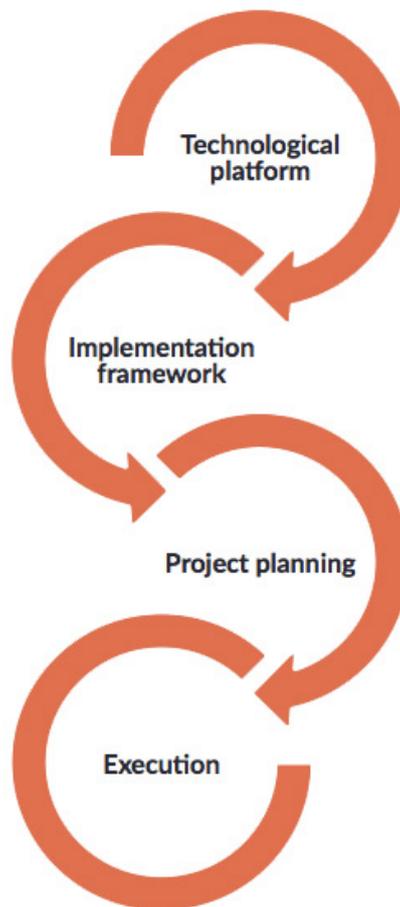
Whilst we recommend using SmartForms as the platform for any transition from paper to electronic forms, the information we are sharing **is applicable to any organisation** considering making the move, **regardless of technological choices.**

ANALYSIS

Having an accurate appraisal of your organisation's use of paper forms is a crucial activity that underpins the success of any transition to paper forms.

1. PERFORM A COMPREHENSIVE INVENTORY AND ANALYSIS OF ALL EXISTING FORMS

Review and document **every paper form** that your organisation currently relies on, by doing at least the following:

IDENTIFYING BUSINESS STAKEHOLDERS

Become aware of which departments/parties within your organisation are responsible for and/or have an interest in any individual form.

IDENTIFYING COMMONALITIES AND RESPONSIBILITIES THEREOF

Paper forms often share **common sections**, where if that section is updated, changes need to be reflected throughout all forms using it.

Common cases are legal information, or generic sections like address information.

Become aware of all of these common sections and importantly, the parties that are responsible for their maintenance.

IDENTIFYING OPERATIONAL AND SECURITY REQUIREMENTS

Become aware of the operational and security requirements that must be met for any particular form.

These could include:

OPERATIONAL

- Wet signatures.
- Dependencies between form fields and sections.
- Particular field types (including file attachments).
- Access of organisation and applicant to submissions, and status thereof.
- Compliance with storage and retention policies.
- Pre-population of data from host environment.
- Runtime checks of certain data (business numbers, security numbers).
- Integration with external systems.

SECURITY

- Pre-authorization to start the form.
- Acceptable submission methods (electronic, postal, in person).
- Storage of partially complete submissions (client side, organisation side).

Fifth Ocean Technologies SmartForms' functionality covers each of these requirements and more.

2. CREATE A ROADMAP FOR INTRODUCING EACH¬ FORM TO YOUR BUSINESS PROCESSES

Conceive of a roadmap that will instruct planning and implementation for the entire suite of forms.

This is the moment during which your organisation is able to **control how quickly change is introduced** to its business processes.

The creation of the roadmap should involve the designers of forms, business stakeholders, processing officers and the owners of backend business systems.

PHASING

A useful strategy to move more safely towards electronic forms is to take a phased approach, where the transition is done incrementally.

For example, a form's mode of operation (i.e. submission process) may be implemented in a simplified way in the first phase (applicant prints finished form and posts it for manual processing), and then improved at a later one (applicant submits form, it's automatically processed).

Taking on the least frequently used forms in the first phase is another strategy that provides an opportunity for a trial run without exposing your organisation's business processes to excessive risk.
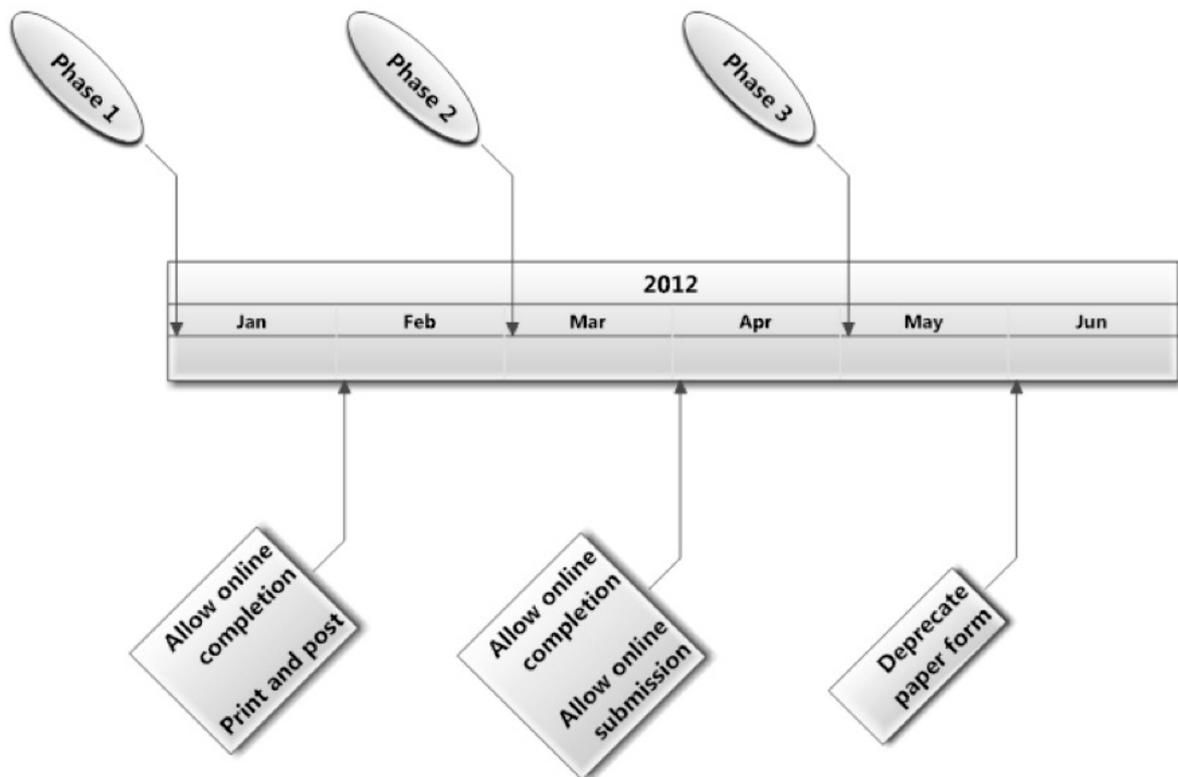

FIGURE 1 - Example phasing for a form

3. DECIDE ON A UNIFORM WAY OF FORM DELIVERY

Decide on and document a uniform way – a blueprint of sorts - of delivering electronic forms to your users via the web. The main considerations include **presentation, accessibility, meta-data, discoverability of forms**, as well as general usability.

If your organisation is working with a large number of forms, it can be the case that no single blueprint will always be suitable. It's useful to be able to deviate from your blueprint at times - but also important to try and limit the number of different variations.

PRESENTATION

The presentation part of your blueprint should outline precisely how you will be conveying the following information:

- Introduction/background info on the form
- Lodgement procedures
- Attachment instructions (how users should attach fingerprinting, photos, financial documents etc.)
- Instructions on working with incomplete forms. For example, a form may need to be partially completed, printed, taken to the bank, signed, and then submitted.
- Sample form and other related documents for preview and print
- Form FAQs and other instructions
- How to get online assistance/help

ACCESSIBILITY

If your organisation requires certain accessibility guidelines to be met (such as WAI-ARIA or WCAG 2.0), it will be necessary to discover what level of compliance is necessary and how this affects the design and implementation of the forms themselves and any other content (such as those items listed in Presentation).

META-DATA

If your organisation requires the use of meta-data (such as Dublin Core, RDFa, or the more recent Microformats) across its web content, the blueprint should instruct which objects should be marked up, and how.

DISCOVERABILITY OF FORMS

Discoverability broadly describes how easy it is for a user to find any electronic form.

Firstly, the blueprint should address how a user might find a form via navigation through your organisation's website. This is largely a matter of working at your information architecture (IA).

Secondly, consideration should be given to enabling search engines to easily locate, classify and index each electronic form.
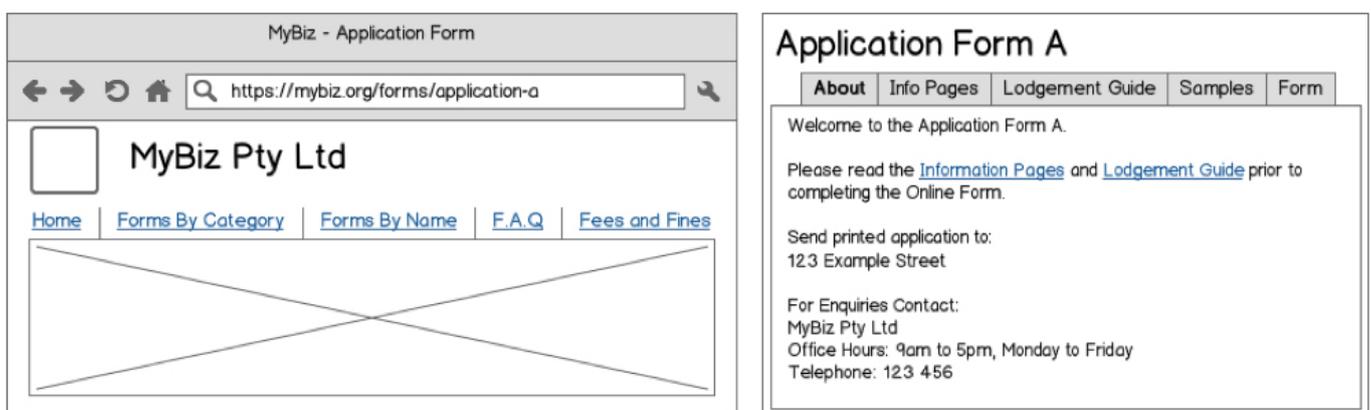

FIGURE 2 - Example uniform way of delivery: presentation

4. DECIDE ON STANDARD MODES OF OPERATION

The mode of operation describes the way in which user/stakeholder interactions with the form occur during the lifecycle of a form submission:

1. **Discovery** – the user locates and prints the form, with the intention of completing it.
2. **Completion** – the user performs the act of filling out the form.
3. **Submission** – the user posts/hands-in the completed form as instructed.
4. **Processing** – the submission is processed by the receiving party.

For each form, describe and document the **current mode of operation** – this will serve as the base upon which extensions (i.e. implementation of electronic forms) will be added.

For each form, decide **which stages** you want **to extend or replace** with the capabilities provided by your electronic forms platform.

For example, at first you may want to give users the option of online completion, but still require them to submit the usual way (by post or hand-in).

Your decisions may constitute part of the roadmap described earlier, should your organisation choose to incrementally upgrade the modes of operation.

MODES OF OPERATION TO CONSIDER

These examples can have features mix and matched, based on your organisation's requirements. SmartForms provides the capability to build these modes of operation and more.

MODE OF OPERATION	BENEFIT
Complete online, print (and optionally Sign), then post.	No form ageing; form validation; no handwriting to deal with.
Complete online, submit electronically.	As above plus very quick turnaround time.
Complete online, submit electronically, print and sign, then post.	Allows for a quick provisional submission, confirmed by wet signature in the post.
Pre-authorize, complete online.	Requires a third party (such as a supervisor or manager) to authorize a submission before it can be made.
Complete online with prefilled data.	Allows form to be pre-populated with data gathered from host environment (such as user information).
Suspended submission, client or backend storage.	For large forms, allow client-side or backend-based storage of incomplete submissions (as required by regulations).

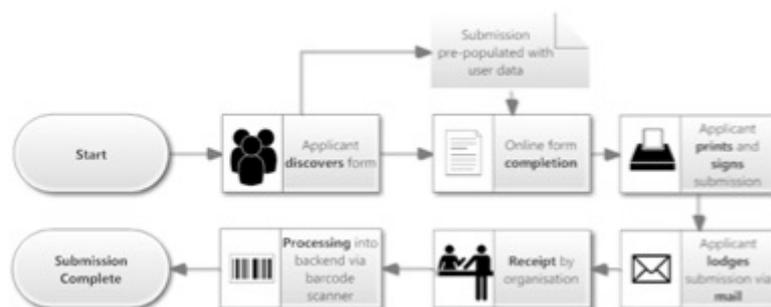
FIGURE 3 – Example mode of operation

IMPLEMENTATION

The analysis, properly complete, provides a comprehensive and dependable single source of information that will advise each step of implementation.

1. CHOOSE THE TECHNOLOGICAL PLATFORM

Choosing the electronic forms platform that your organisation is going to use is a major decision.

Above all else, it needs to be clear that all requirements gathered in the Analysis stage can be met by the platform you are going to commit to. If any requirement cannot be fulfilled, you need to reconsider it, or select another platform.

SmartForms, for most organisations, capably meets all of the requirements listed herein.

ENVIRONMENT

The electronic forms platform should be capable of operating fully within the environment available to it, as per your organisation's requirements.

The platform should provide answers as to the **security of submission data** during preparation, suspension, submission, processing and retention. Some agencies have a requirement to not make data access available until a document with a wet signature arrives – does your organisation need this, does the platform under consideration support it?

The platform may need to be able to **operate in a multi-tiered and physically separated environment** (Internet, Intranet and DMZ). Does your organisation require processing and storage to be isolated from internet-facing networks?

Is the platform compatible with your organisation's **Standard Operating Environment** (SOE)?

Does your organisation require **standards-based integration** of the forms platform (data export, querying, submission etc.) with external systems? Does the platform provide channels to achieve these integrations?

See also the **'Infrastructure'** section towards the end of this whitepaper.

ORGANISATIONAL STRUCTURE

In the analysis stage you should have documented all stakeholders for every form in your organisation.

When choosing the platform, it's important to verify that you are going to be able to map **your organisation's structure, roles and responsibilities** to the users/group/permissions system.

Take particular note of any common form sections/templates that will be required, and how their presence/setup will play out.

TECHNOLOGICAL SUPPORT FOR ALL FUNCTIONAL REQUIREMENTS

Take into consideration allow of the **technical features** that are going to be required in operation.

These could include, but are certainly not limited to:

- Ability to support simultaneous versions of electronic forms at one time without causing disruption (useful for change management).
- Delivery of applicant data in a variety of formats (such as PDF).
- Printing of incomplete submissions (as might be required by the Modes of Operation)

- Special field types required by particular forms
- Workflows (such as email notifications, integration with external systems).

2. CREATE AND DOCUMENT THE IMPLEMENTATION FRAMEWORK

Creating the implementation framework essentially involves performing all of the preparatory legwork required to start implementing the forms.

FORM HIERARCHY/MAP

Map out/diagram the **full hierarchy of forms** and their constituent common parts, not dissimilar to the way a class diagram is done.

The map should include all commonalities, authors, and stakeholders, business processes as well as the relationship between forms, if any.

SETUP THE SYSTEM

Deploying and configuring the electronic forms platform, as well as any other required systems should be performed, and is largely a task for I.T.

Once the basic system is up and running, setup of your organisational structure and users will need to take place as well.

TEMPLATE THE UNIFORM WAYS OF DELIVERY

According to the blueprint that was documented earlier, **any uniform ways of delivery** decided upon should be **templated**.

They should be published in a way that is convenient for implementers of electronic forms to later utilise or copy.

PERFORM PREPARATION FOR THE DECIDED MODES OF OPERATION

Make sure that all of the **points of interaction** in all forms' lifecycles are prepared to work with any new or changed **modes of operation** that are being introduced.

These points of interaction might include:

- The discovery of the form by the user
- The lodgement of the form by the user
- Receipt of the submission by the organisation
- Processing of the submission and interaction with any business processes

For example, if receipt of a submission requires the reading of a form barcode, a barcode scanner will need to be setup at any place where submissions are handled, along with the relevant procedures.

ESTABLISH PUBLISHING AND CHANGE MANAGEMENT PROCESSES

Decide on and document the procedures and processes that implementers should follow when publishing new electronic forms or making changes according to existing ones.

These will be informed by the existing procedures in place that were in use for paper forms.

SmartForms provides a publishing process that allows for uncomplicated publishing, testing, and approval of changes to forms.

3. PERFORM PROJECT PLANNING

Project planning is largely a matter of turning your transition roadmap and form hierarchy into a concrete implementation plan.

At first, it is necessary to determine all work that is necessary for an introductory implementation. Once you have a good idea of what items need to be completed, you will need to plan to align them as best as is possible.
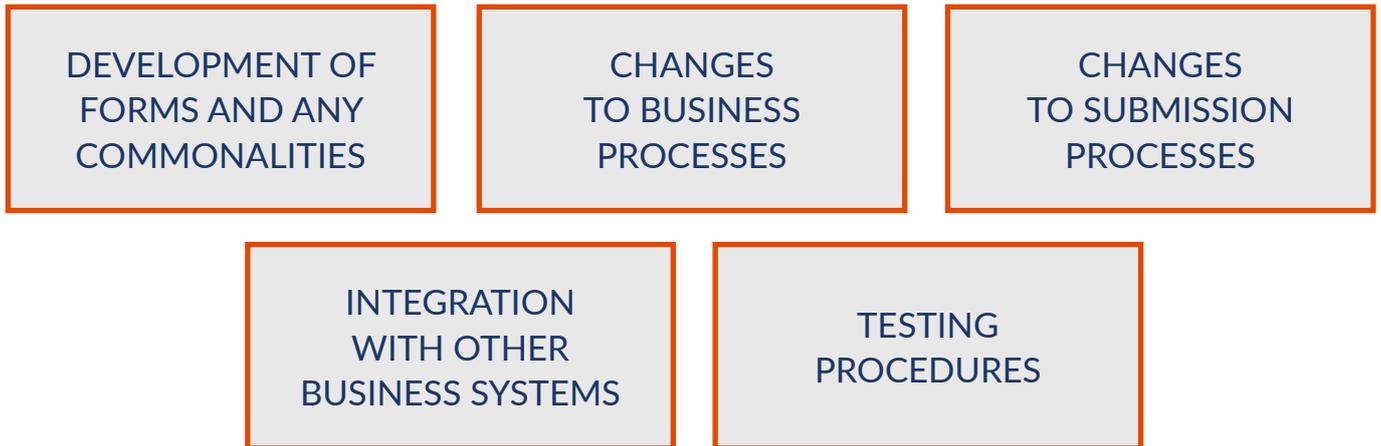
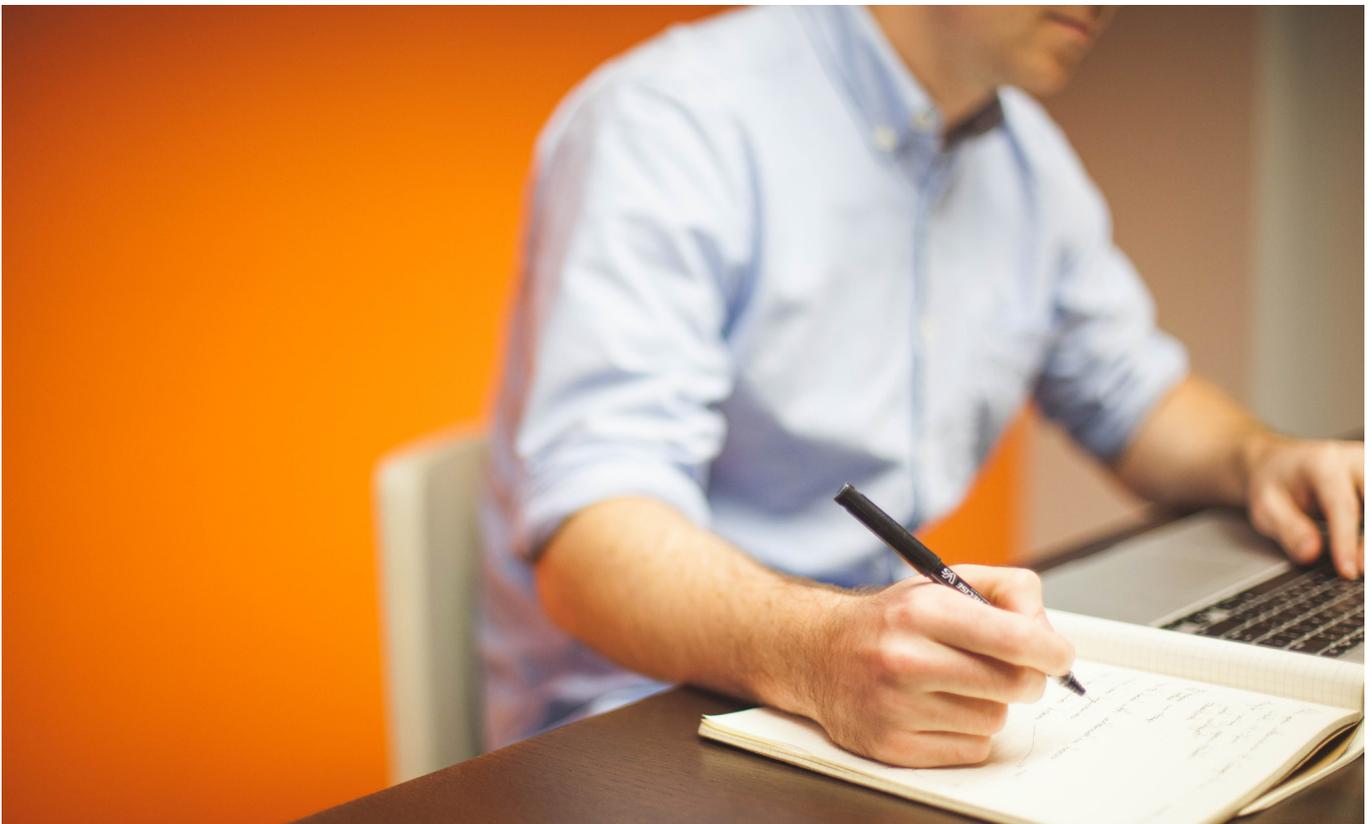| DEVELOPMENT OF FORMS AND ANY COMMONALITIES	CHANGES TO BUSINESS PROCESSES	CHANGES TO SUBMISSION PROCESSES
INTEGRATION WITH OTHER BUSINESS SYSTEMS	TESTING PROCEDURES	

FIGURE 4 - Pieces of work that will need to be aligned in the project plan.

4. FOLLOW THE PLAN (IMPLEMENTATION COMPLETION)

Actual implementation of forms should be fairly straightforward, provided that analysis and planning is largely adhered to.

There are few pitfalls, as follows, which you may run in to, but they can be mitigated fairly easily.

DYNAMICS

Dynamics describe when fields (or groups of fields, or pages) are dependent on each other, in terms of being visible or not or the values that they may contain.

Paper forms are not capable of dynamics, so it pays to be wary and try to understand the form you are implementing from an applicant's perspective, not purely from a technical one. **Plan the dynamics out.**

COMPLETION CRITERIA

Sometimes nobody really knows when you can call a form submission 'complete' (i.e. acceptable for processing). Sometimes some fields are optional, sometimes nobody quite knows whether a field is mandatory or not.

This problem is not acceptable where electronic forms are involved. Unfortunately, the only true way to deal with this problem is to sort the confusion out and make an unequivocal statement about when a field is optional or isn't (don't be lazy and fix the design).

FOLLOWING YOUR ROADMAP WITHOUT CAUSING DISRUPTIONS

Proceeding along the phases in your roadmap can be nerve-wracking, due to the perpetual risk of inadvertently breaking some part of your electronic forms when making incremental changes.

If your forms platform supports running multiple versions of a form, as well as multiple modes of operation simultaneously, this process is considerably easier.

Deploying the changes by side with the current version allows a pilot group of customers go through the new version. This should provide some assurances that nothing has been broken.

SmartForms allows you to easily deploy two varying deployments of the same form side by side.

If all goes smoothly, you can proceed to deprecate the old version of the form. If not, your organisation's exposure is limited.

INFRASTRUCTURE

Every organisation needs electronic forms, but is also unique in varying respects. Regardless of your electronic forms platform choices, the question of what kind of underlying infrastructure you want to use will probably cause some head scratching.

It can be a challenge to **identify and understand what infrastructure choices** are available and best suited to your organisation.

Your choices should reflect the requirements of your business, which could include:

- Business size
- Current and future operational requirements
- Funding capability
- Growth expectations
- Requirements in regard to infrastructure ownership
- Data security
- Current and projected form processing volumes
- Regulatory requirements

INFRASTRUCTURE CHOICES

Ideally, your organisation's forms platform of choice should be versatile enough to be deployed in any of these infrastructure modes. SmartForms can be deployed in the following modes and more.

| INFRASTRUCTURE KIND	DESCRIPTION
Cloud Software-as-a-Service	Pay-as-you-go pricing No capital funding requirement No operations responsibility Suitable for small and medium enterprises.
Co-owned infrastructure	Several organisations with shared ownership, use and maintenance of IT infrastructure. Suitable in the presence of common regulatory and/or security requirements (e.g. regional associations of government bodies).
Fully owned infrastructure	Highest total cost of ownership (TCO). Suitable for medium to large and government organisations, high transactional volumes, and intranets.
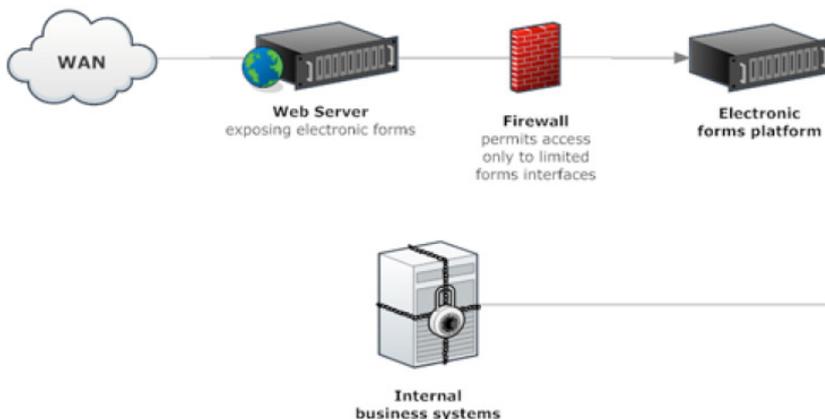
FIGURE 5 – A 'higher' security electronic forms setup (fully owned)

FIFTH OCEAN TECHNOLOGIES' SMARTFORMS

This whitepaper is the culmination of our experiences of helping businesses and government organisations in making the transition from paper to electronic forms.

SmartForms is a comprehensive electronic form's platform. It, as a result of our experiences, is a platform extremely capable of meeting the challenges of that transition.

SmartForms provides a wide and ever-growing range of features to ensure that your organisation is capable of effective design, integration with your systems, deployment and test, operation and maintenance of your data collection and processing facilities.

DESIGN	DEPLOYMENT & TEST	INTEGRATION	OPERATION & MAINTENANCE
Supports **practically any type of input data** fields and other assets, such as content and instructions.	Full-cycle, integrated change control, test and release management.	**Integration of forms with the host platform** during initial access, pre-population, run-time, execution, submission and post-submission phases.	Facilitates organisation's adherence to Electronic Records Management standards and guidelines, such as ISO 15489.
Tools for organising highly **dynamic** and deep **dependencies** between fields, groups of fields, pages and assets.	Fast tracking of form changes, from concept to the go-live stage.	Operates in **single and multi-tier modes** ensuring that SmartForms fully fits with your organisation's infrastructure.	**Multi-tenancy and cross-group maintenance of forms;** each department may maintain own forms; certain areas for every form could be under control by specific groups, e.g. legal.
Delivery of data for **large forms** in a multi-page hierarchy.	Import / Export facilities ensure that new forms, or sets thereof, can be quickly deployed and made available.	Range of pre-set, custom and BPMN-2.0 **workflows** enables powerful **extensions** to the **form submission process.**	**Templating** capability completely **stops the 'ageing' process** of organisation's electronic documentation, records and forms.
Standard, **well documented XML format** for form design.	Provides additional suite of functions, online applications and deployment blueprints to ensure that forms are discoverable and correctly utilised by users.	Configuration-based options for collection and delivery of form data are able to provide **solutions for a wide spectrum of security requirements.**	
Ability to **meld look-and-feel** to fully match that of your organisation.	Launch pages to ensure that forms can be located via search engines.		

SmartForms is available in all configurations that we have described, licensed in a way that is suitable to organisations of any size. **For more information visit www.fifthocean.com.au**

ABOUT FIFTH OCEAN TECHNOLOGIES

The Fifth Ocean Technologies team is located in Melbourne, Australia, with regional offices throughout the Asia Pacific. Established in 1996, we have been providing eBusiness solutions for corporate small to medium and government enterprises, including local and state government.

We are very glad to be sharing our experiences and findings with others and hopefully help more organisations make the move towards effective use of electronic forms.

Should you have any interest in making such a transition, we are more than happy to provide **obligation-free advice** about what options are available to your specific organisation and, if you like, assist in planning and execution.

CONTACT US:

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