USING PROCESS MODELING TO DRIVE AUTOMATION

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INTRODUCTION

In many industries, there is an ongoing trend towards automating or semi-automating routine business processes in order to create efficiencies. When the right types of processes are automated in an appropriate way, there will often be significant benefits to be realized. Done well, automation can reduce processing costs and improve customer experience. We might, for example, speed up a process that was slow and frustrating to the customer, creating benefits for us and for them.

Yet, unfortunately not all process automation initiatives have these positive effects. Without sufficient analysis we might inadvertently end up automating a bad process – which is likely to lead to a range of problems and undesired negative outcomes. We might find that people have been acting judiciously to keep the process running for years, and had developed a whole series of manual workarounds. If we do not understand the issues with the current process, then there is no way that we can resolve them. Introducing automation without simplification and rationalization of a process can simply make a bad process even worse!

As business analysts and process analysts, there is a great deal that we can do to avoid these types of situations occurring. With up-front analysis we can weed out the problem areas, and increase the likelihood of a successful implementation.

START WITH PURPOSE

When considering process automation, it is very tempting to jump straight into specifying what the automated system should do, yet there is a significant benefit in taking a step back and asking ourselves what is this process actually for?

This might initially sound like a rather simplistic question – as it may initially appear that a process has a very clear purpose. We might assume, for example, that the "Issue Invoice" process exists to, well, issue an invoice! Yet further discussion and analysis may lead us to conclude that the process actually exists to encourage clients to pay. It sits within a broader family of processes related to billing and credit control.

This is important to consider when automating processes, as there may be opportunities to utilize technology to ensure that the process better meets its ultimate aim. If we were, for example, automating or semi-automating the issuing of invoices, we might implement a solution that includes a payment link on the invoice. This may lead to quicker payments being made, and may also reduce the demand on other processes (such as credit control and the chasing of unpaid invoices).

As well as considering purpose, it is worth thinking about the transformation that the process is performing – or rather, the transformation that it ought to be performing! Processes generally respond to a trigger (a business event) take inputs, perform some form of transformation on those inputs, and produce outputs (which are passed to the customer or perhaps to another process). Processes also enforce rules, and are supported by (or support the needs of) stakeholders – this is shown in Figure 1. It is worth considering each of these elements in turn. This will also help us scope out the boundaries of the process that we are examining.

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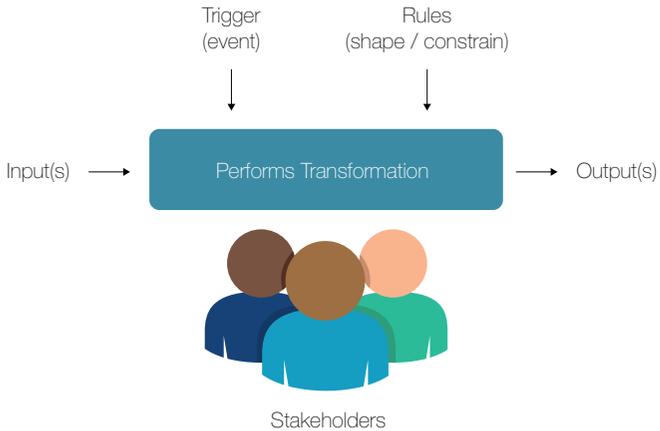
Figure 1: Elements for Initial Consideration

START WITH PURPOSE (CONT...)

Taking our 'issue invoice' sub-process, we might discover that:

Trigger	Time (for clients billed on a monthly basis) Completion & acceptance of work (for other clients)
Input	Pricing data from sales team Client's purchase order (where available) Description of work undertaken Client information
Transformation	Take inputs and produce, review, approve and send an invoice that is accurate, concise, and provides all of the details needed by the client in order to make a payment
Output	Approved invoice sent to client

This succinct table shows some important information about the boundaries of the process. It shows what triggers the process, but crucially also shows the point at which it ends. It shows that this particular process does not (for example) handle the receipt or chasing of payments. We might find that some stakeholders believe that payments ought to be part of a longer end-to-end invoicing process – and if automating invoicing we ought to consider payment handling too. This view is a sensible one, but it would be important that we have a clear consensus over what is included and what is not

included in the automation initiative. Putting together a table similar to the one above prior to conducting detailed process analysis and modeling can lead to useful debate over scope – and these types of debate are usually best addressed as early on as possible so that the project team can move forward in unison.

This leads us to another important question: who holds a stake in the process? Or, put differently, who are the process' stakeholders? Normally, we find that some stakeholders will be immediately obvious. In our invoicing example, the invoicing/accounts receivable team would clearly be key stakeholders and they would need to operate any kind of automated or semi-automated system that we implemented. It will therefore be crucial that we understand their needs.

Customers will also be important stakeholders, as (in this example) they actually need to pay the invoices. Understanding how our customers' accounts payable departments work may help us to ensure that the invoices we send are easy for them to process. For example, we'd likely find that some organizations issue 'purchase orders', and that invoices are much easier for them to handle if the purchase order is noted on the invoice. Those that do not issue purchase orders may prefer the purchasing/authorizing manager or cost center to be annotated on the invoice. Automation provides us with the opportunity to automatically populate this information – assuming that we have it – or at the very least to prompt people to double check the invoice if the information isn't present.

START WITH PURPOSE (CONT...)

However, there will likely be a whole range of other stakeholders too. We might find that there is a regulator that mandates the information that must be displayed on invoices, or a contracts manager that determines how frequently invoices are sent. We might find that invoices are also used internally by the sales team to understand how much an existing client has spent (so that they can target their follow-up sales activity accordingly). When it comes to stakeholder analysis, it is best to spread the net wide.

As we liaise with the relevant stakeholders, we start to get an enhanced view of the requirements, rules and constraints placed on the process. We should also consider broader constraints and rules too – perhaps organizational rules ("Invoices must be sent via e-mail unless the client has opted for paper copies") or regulatory edicts ("Invoices must always display the VAT number when VAT is charged"). It will, of course, be necessary for us to understand these angles in finite detail when we get closer to automating the process, but understanding the 'chunky' or particularly troublesome areas now can be valuable, and can help shape the analysis that follows.

OBJECTIVES

Closely related to process purpose are the process objectives – or to be more specific measurable objectives. It is likely that there will be certain Critical Success Factors and related Key Performance Indicators that stakeholders are aiming to improve, along with a range that they will also be wanting to monitor on an ongoing basis. Knowing this is crucial, as this ensures that our improvement and automation efforts are focused in the right areas.

In our invoicing team, we might discover, for example that a key driver is to reduce the 'processing cost per invoice issued', but that there is also a desire to reduce the number of mistakes, and increase the number of invoices paid on time. The Balanced Business Scorecard approach can be a useful tool when defining or refining organizational targets (see the 'further reading' section).

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EXAMINING THE 'AS IS' PROCESS

One somewhat controversial question amongst practitioners is "do we need to consider the 'as is' process if we are completely re-designing it and automating it?". There are undoubtedly situations where this is less valuable, but for complex processes that have evolved and been adapted over a number of years, it is often very useful to understand the way things currently work – including all the existing 'quirks' and inefficiencies. This will ensure that we do not inadvertently re-introduce these inefficiencies into the new automated process. It is all too easy to fall into the trap of unconsciously repeating the same mistakes that have been made in the past, as the root causes were never discovered and discussed.

An understanding of the current process can be achieved by working directly with the relevant stakeholders, perhaps undertaking a series of observation sessions, interviews and workshops. Understanding generally how the process works will help us consider which parts need to change prior to automation, and it is also an opportunity to discuss any problems that those involved with the work have found with the process. Often, people operating processes are extremely diligent and will have invented their own 'workaround' solutions. It is crucial that these are considered, so that the new process can take into account the process gap that they are plugging. We have probably all seen processes where a worker suddenly pastes data out of the 'official' system into a local spreadsheet or database, as the 'official' system didn't ever quite do what it was supposed to do. In situations like this, the workaround is masking an underlying issue, and it may be necessary for us to resolve that underlying issue before we automate the process.

When liaising with stakeholders on the front line, scenario analysis can also be valuable. Observation and interviewing will often help us uncover the 'happy path' through a process, but people might not always think about the exceptions that occur. Yet, the new automated process will need to cater for these exceptions too (or, at the very least, identify them for manual handling) so it is crucial that they are understood. Neglecting this step often leads to processes that work for most customers, until there is some kind of problem – then the customer will likely get frustrated as the process appears inflexible to their needs.
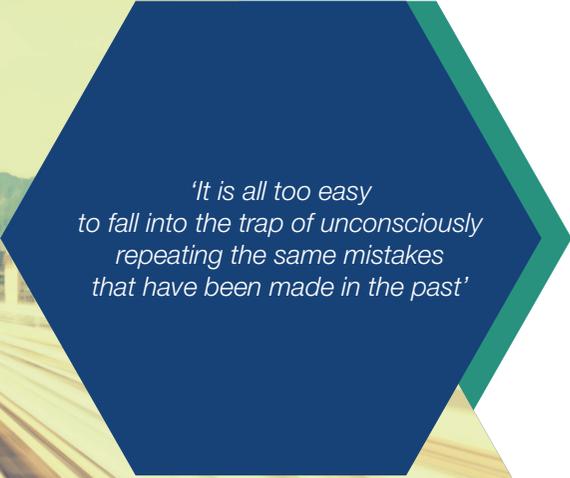
'It is all too easy to fall into the trap of unconsciously repeating the same mistakes that have been made in the past'

UNDERSTAND THE RULES

As alluded to earlier, it is crucial that we understand and document the business rules that a process needs to enforce. This is particularly important when automating a currently manual process, as we may find that up until now, those rules have been evaluated entirely manually. They may not be documented in their entirety, and although each rule ought to map up to higher-level policy, legislation or regulation, we may find that some unnecessary rules have crept in over the years. Alternatively, we may find that the existing process is enforcing rules which are no longer relevant or necessary! This is the perfect opportunity to rationalize, document and optimize the rule set.

The International Institute of Business Analysis (IIBA)®'s Business Analysis Body of Knowledge (BABOK®) Guide provides the following description of business rules analysis:

"Business rules analysis is used to identify, express, validate, refine and organize the rules that shape the day-to-day business behavior and guide operational business decision making" (IIBA, 2015)

BABOK® goes on to describe two commonly used categories of rule:

Definitional rules: Definitional rules help to define or scope relevant business concepts, or define how certain concepts relate to each other. Since definitional business rules provide definition, they cannot be violated. An example might be:

"A **company** must be considered a **customer** once it has placed **one or more order(s)**"
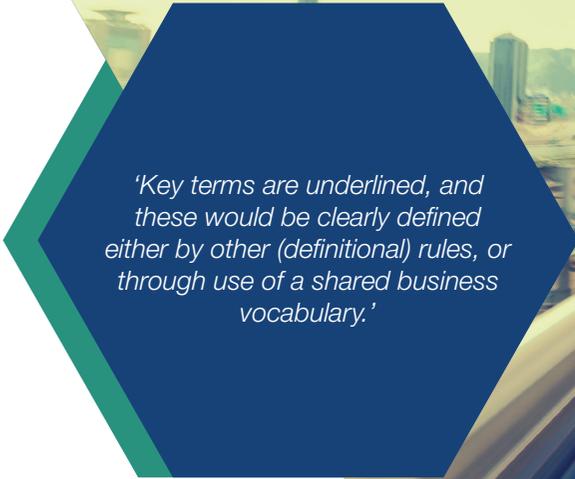
'Key terms are underlined, and these would be clearly defined either by other (definitional) rules, or through use of a shared business vocabulary.'

Behavioral rules: By contrast, behavioral rules constrain or shape how work is undertaken. They might restrict or prohibit certain behaviors. Behavioral rules could, at least in principle, be violated. An example might be:

"An **invoice** must not be sent to a **customer** that is marked as **'under review'**"

Alongside rule definition, it is valuable to discuss which (if any rules) can be 'overridden' – and who by.

The example rules shown above are expressed in natural language. Key terms are underlined, and these would be clearly defined either by other (definitional) rules, or through use of a shared business vocabulary. Natural language can be a very effective way of expressing rules, although alternative approaches such as decision tables, or the Decision Model and Notation (DMN) standard may be relevant.

MOVING TOWARDS THE "TO BE"

Once we have built a model of the 'as is' process and have analyzed other relevant environmental factors and business rules, we can then start to formalize the target state. This is another area where our process improvement and modeling skills can help drive automation – a useful question to ask ourselves is "can this process be improved before (or as) we automate it?". We can take into account the types of improvement factors that we would typically look at when improving any process – handovers, duplication, delays, bottlenecks and so forth. We should look to make the process as 'clean' as possible before we automate it. If we don't, we risk 'baking-in' all of the inefficiencies of the current process.

This is also an opportunity to consider how exceptions will be handled. One significant consideration when undertaking full-on automation, is that the process definition will likely need to be much more granular than the

equivalent manual process definition. Many manual processes rely on human judgement – a human being can spot an exception and deal with it accordingly. An automated process will need to have the decision logic built in to detect and deal with exceptions accordingly.

Take our invoicing example. Our invoicing team may know that we have three clients who are based in the Middle East, and we have agreed to produce the invoices in a different currency (and provide different payment terms). Yet, unless this is somehow flagged on the system, an automated solution would not take this into account and would likely send standard invoices. Asking questions such as "what if…" and "what else…" when examining processes and scenarios can help us to uncover and capture these areas.

With full scale automation, we will need the process models that we create to be executable. BPMN is an excellent standard, as it allows granular and executable process models to be created. BPMN also allows for different 'views' to be created of a process – perhaps a high-level view for the sponsor, and a detailed view for validating with the business users and stakeholders.

The rules that have been captured can be cross-referenced with the BPMN model, so it is clear when the relevant rules are run/enforced. Each rule may be used multiple times, potentially by different processes – so maintaining rules separately (both when they are defined but also when they are implemented) can have benefits for ongoing management and maintenance. For example, if a rule changes, it only needs to be updated in one place and it is easier to assess the impact of those changes.
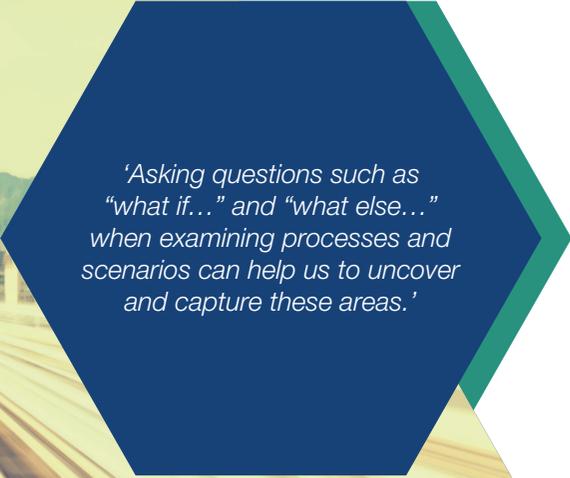
> *'Asking questions such as "what if…" and "what else…" when examining processes and scenarios can help us to uncover and capture these areas.'*

DON'T FORGET THE NON-FUNCTIONAL ELEMENTS OF PROCESS AUTOMATION!

Alongside considering the functional elements of an automated process (what the process should do), it is also important to consider the non-functional requirements (NFRs) that the solution should meet. There are many different categories of NFR, those listed in IIBA® BABOK® guide are shown in Figure 2.

'Alongside considering the functional elements of an automated process (what the process should do), it is also important to consider the non-functional requirements (NFRs) that the solution should meet.'
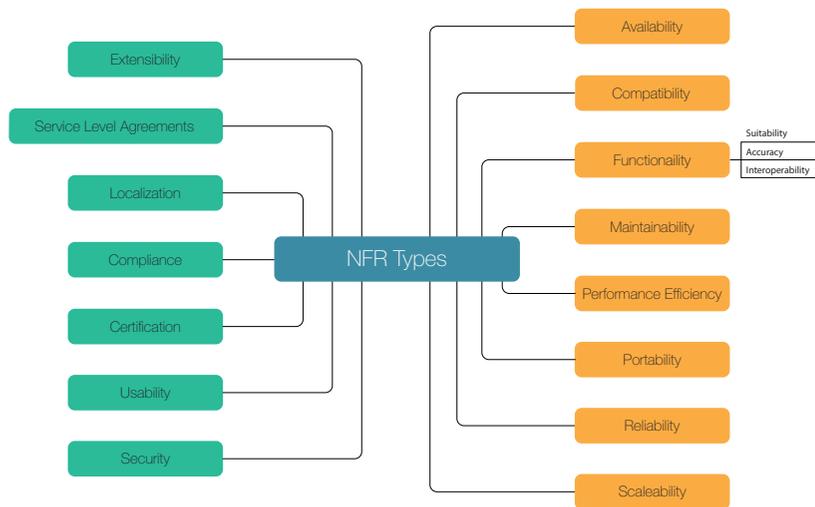
Figure 2: NFR types from BABOK® v3

Please see BABOK® for a more detailed explanation of each category

Of particular relevance may be:

Security, Roles & Access: Who can operate/access the process? Who can trigger it? Who manages, administers and changes it?

Extensibility/Extendibility: To what extent does it need to be 'configurable?'

Availability: What level of availability is required (e.g. 99.9999%? 80%?)

Disaster Recovery & Back-up: What recovery-point & recovery-time objective shall apply to the automated process?

Scalability: To what extent can the solution 'scale'? Will it cope with the anticipated volume of demand?

CONCLUSION

Automation is frequently considered an effective way of improving business processes. Yet automation without analysis is likely to lead to unexpected and negative outcomes. Spending time up front understanding the purpose of the process, and any existing 'quirks' will help us ensure that we can design an efficient and effective automated process. Process modeling can be used to drive automation, alongside capturing and cataloging of business rules. If we consider all of these things – including the non-functional elements – then we will be on course for process automation that delivers the demonstrable benefits that our stakeholders' desire.

REFERENCES & FURTHER READING

Readers interested in the topics discussed in this e-book may find the following resources useful:

Cadle, J., Paul, D. and Yeates, D. J. (eds) (2014). Business Analysis. Swindon: BCS Learning & Development Limited.

Kaplan, R. and Norton, D. (1996). The balanced scorecard. Boston, Massachusetts: Harvard Business School Press.

IIBA, (2015). Guide to the business analysis body of knowledge. Toronto: Ontario: International Institute of Business Analysis.

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Reed, A "Adrian Reed's Blog" [Online] http://www.adrianreed.co.uk