

CREATING A DIGITAL TWIN OF YOUR BUSINESS OPERATIONS WHITE PAPER

The Data Forge approach to creating a digital twin that enables your organisation to supercharge the creation of agile and continuously adaptable business operations.

INTRODUCTION

Digital twin has been used historically to describe 'a digital representation of a physical object'. In the world of software driven business operations it is a new(ish) and growing concept. Gartner define it as:

"A DYNAMIC SOFTWARE MODEL OF ANY ORGANISATION THAT RELIES ON OPERATIONAL AND/OR OTHER DATA TO UNDERSTAND HOW AN ORGANISATION OPERATIONALISES ITS BUSINESS MODEL, CONNECTS WITH ITS CURRENT STATE, RESPONDS TO CHANGES, DEPLOYS RESOURCES AND DELIVERS EXPECTED CUSTOMER VALUE."

Combining the digital twin of an organisation (DTO) concept with the business operating system (BOS) framework, this whitepaper provides an approach for organisations to start small and rapidly iterate towards bigger picture goals. At the heart of this is helping organisations understand and continuously improve operations through mining, mapping and testing multiple alternatives scenarios, before moving onto delivery and then repeating the cycle.

Concepts, frameworks and capabilities covered in this paper include: the digital twin of an organisation, business operating systems, process mining and mapping, scenario modelling, simulation, process documentation and monitoring.





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WHAT IS A DIGITAL TWIN OF AN ORGANISATION'S BUSINESS OPERATIONS?

Digital twins of the organisation's business operations are designed to create a digital representation of the current operations as a means to continuously deliver rounds of improvements.

Digital twins enable organisations to understand their current state (Twin A) and then use this to model, test and implement improved future states (Twin B, C, D etc.). Once complete a new round begins as new opportunities for improvement are investigated and implemented – see illustrative diagram 1 below.

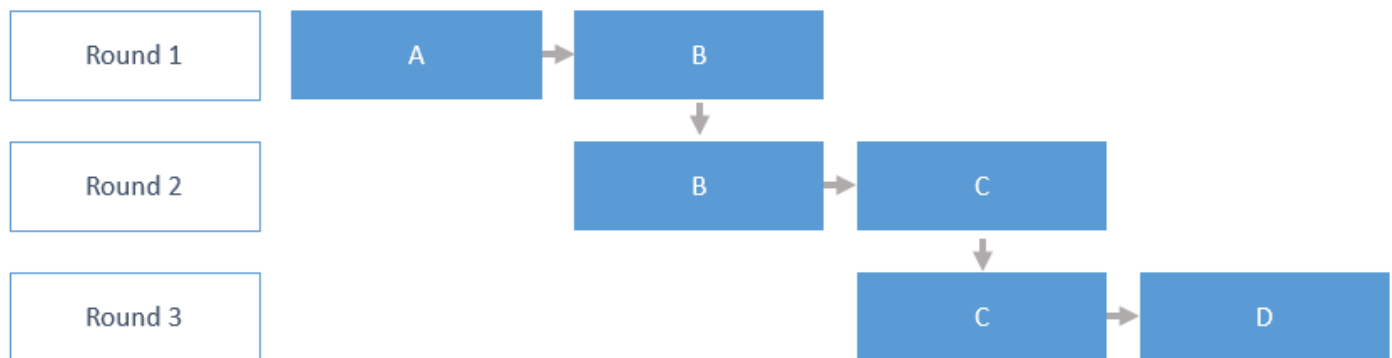


Diagram 1: Continuous rounds of improvement from Digital Twin A to B, C, D etc.

Take an organisation's purchase-to-pay function. By creating a digital representation of operations, such as the invoice and payment processes, it is possible to mine and analyse the flow of invoices in and payments out, identify any performance or quality issues, and model and test different scenarios for addressing them, before implementing the option that is most likely to deliver improved performance and/or quality. Once finished, the process can be repeated or new areas explored in a virtuous cycle of continuous improvement.

Across business operations in different organisations and industries, the creation of a digital twin can provide answers to specific questions such as:

- Is the organisation meeting customer and partner expectations?
- Are there opportunities to deliver more value and better customer experiences?
- Are changes in the external environment (e.g. regulation or competition) having a negative or positive impact on operations?
- Are extra resources required to handle additional business process volumes in scenarios such as a successful sales campaign or an unexpected increase in customer service requests?
- When will a return on investment be achieved from using Robotic Processing Automation (RPA) or other system changes?
- How will a change impact customers, internal stakeholders and partners?
- Will a business process change result in increased revenue or reduced cost?
- Does resource (employees, external suppliers, technology platforms, transport, etc.) availability cause process bottlenecks?
- Will a change in working patterns reduce process cycle time?
- Would the use of less experienced and lower cost resources that take longer to complete an activity and have a higher rework rate be more, or less, cost-effective?

To maximise the value and effectiveness of a digital twin, it's important to see the bigger picture, but start small. Whether at a goal or functional level, this starts by having a clear view of where you want to get to and or the business areas to address. From here the focus shifts to incrementally working through specific activities to reach your bigger picture goal. Taking this approach will help to reduce risks and speed up delivery of positive outcomes.



WHAT IS THE BUSINESS OPERATING SYSTEM FRAMEWORK?

The business operating system framework provides a useful guide for organisations seeking to implement a digital twin of their organisation's business operations.

Focusing on 6 key areas (see diagram 2 below), the framework enables organisations to follow a structured path.

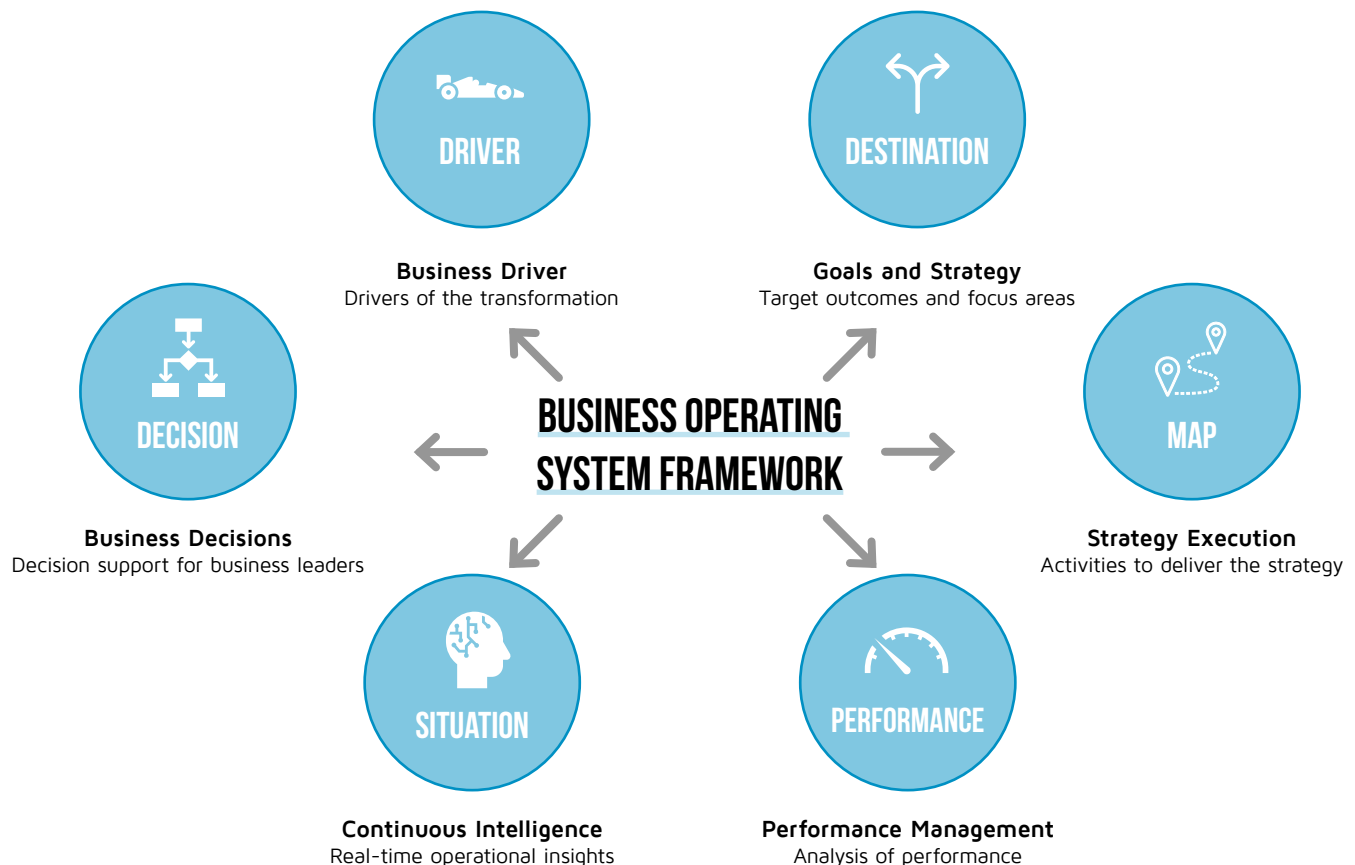


Diagram 2: Business Operating System framework

Capturing '**business drivers**' is about understanding and creating a clear view of the business or initiative context. Using sources such as current operational performance (e.g. KPIs), c-suite initiatives (e.g. customer centricity, cost savings or new business models), market changes (e.g. digital opportunities, changing competition and dynamics) or regulatory requirements (e.g. AML4, PSD2) the baseline drivers can be identified and used to determine the goals and strategy.

'**Goals and strategy**' focus on defining a clear destination (or vision) and high level areas of focus (at an organisational, initiative or process level) that the team can get behind and support.

Tip: Consider using transformation maps (see diagram 3 below) and dashboards (see diagram 4 below) to help capture and track your goals and strategies.

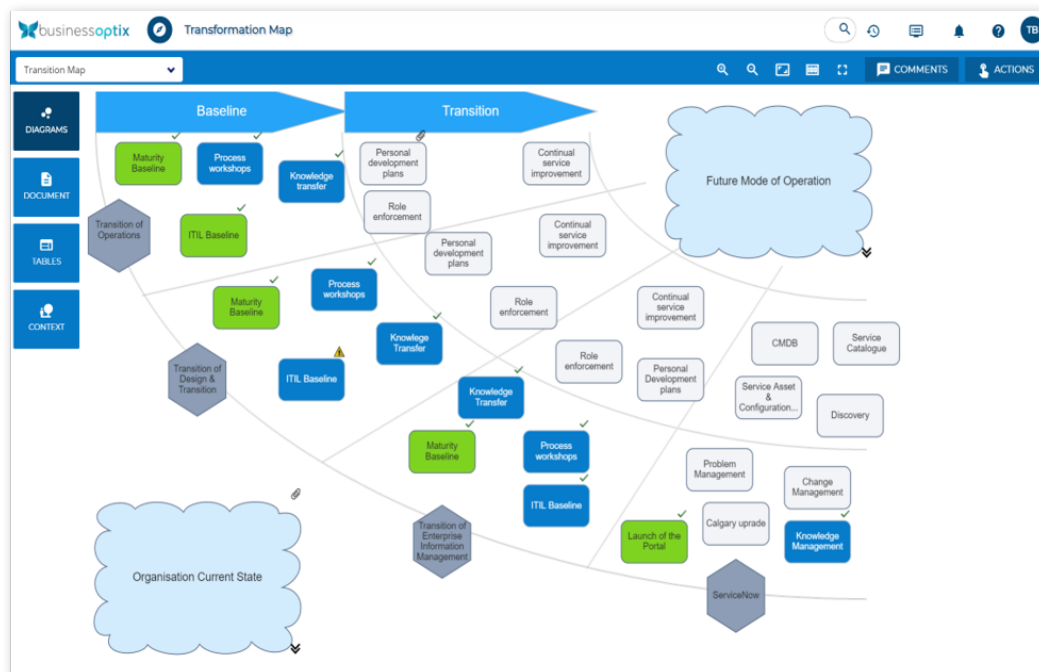


Diagram 3: Transformation Map

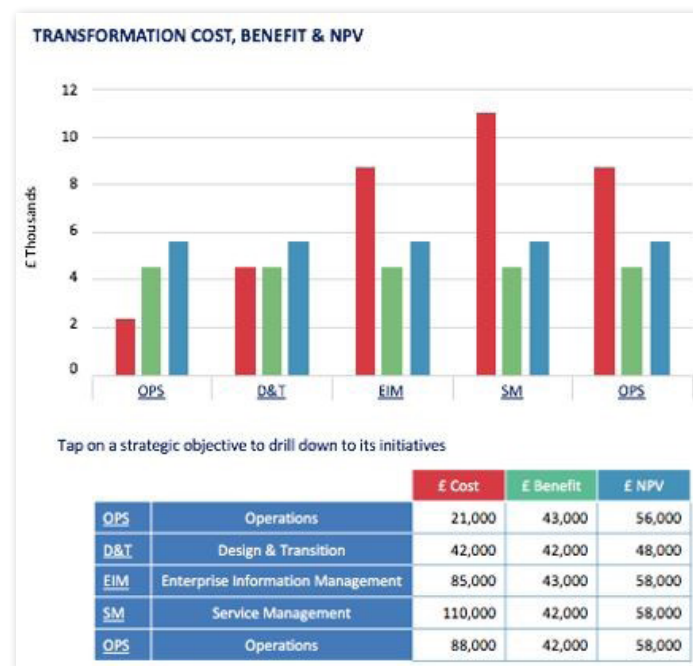


Diagram 4: Transformation Dashboard

'Strategy execution' starts by creating a view of where the organisation is today. From this, gaps and opportunities to improve can be identified.

Once complete, decisions can be made about the specific areas and levels of improvement. For instance, should the focus be on a transformative (making fundamental changes to how business is conducted) or incremental (moving from one state to a state considered to be better) approach?

https://en.wikipedia.org/wiki/Business_transformation
<https://en.wikipedia.org/wiki/Improvement>



'Performance management' focuses on setting and tracking metrics that illustrate the performance of tests and in-life operations.

'Continuous intelligence' focuses on continuously monitoring and providing insights from live data that tells the story of how the process is functioning against the key metrics and any tolerances or SLAs that have been set and need to be adhered to.

Combining outputs from performance metrics and continuous intelligence, **'decision making'** enables the organisation to pause, ingest insights and make decisions about its next steps.

The framework helps to answer questions such as why do we need to transform or improve? Which parts of our operations and processes need to change? What does success look like? How will the needs of customers and the business be met? How will efficiencies and cost savings be made? Where should we start? What are the quick wins? What strategic and tactical approach should be taken? What will it cost and how will it be resourced? How will the initiative be governed and managed? How will sustainable capabilities be created and embedded in the organisation? How do we identify and test alternative ways of working in a low risk way?

As well as opportunities to improve operating models and processes, organisations that use the business operating system framework have been able to identify and address issues such as absent or unclear business, operating and capability models and processes; a lack of team knowledge and or competence; non-standardised management methods and standards; duplication of efforts; a lack of integration, collaboration or knowledge sharing between teams, functions and business units; lack of clear metrics and performance indicators; and deficiencies in governance.

A more detailed look at all of these areas (including guidance and additional tools for setting yourself up for success) can be found in the paper **'Successfully Transforming and Improving Business Operations'**.



USING THE BUSINESS OPERATING SYSTEM FRAMEWORK TO CREATE A DIGITAL TWIN OF YOUR ORGANISATION'S OPERATIONS

Through the business operating system framework, it is possible to create and use a digital twin. The following example focuses on creating a digital twin of key processes within the operating model.

As with any initiative, it must start with a clear definition of the outcome (objective) you want to achieve. Typical outcomes may be to reduce operating costs by £5m in 12 months, reduce process times by 15 seconds, increase the % of responses under 10 seconds from 65% to 75%, achieve service levels of 95%, implement new regulations before they become law, or any other operational metric that relates to the organisation's work.

Next, select the first area of focus (remembering that the aim is to start small and build) that will enable you to achieve the desired outcome – for instance, a particular area of the business or area of the operating model. From here a 5-step approach can be used to create and deliver your digital twin – see steps below.

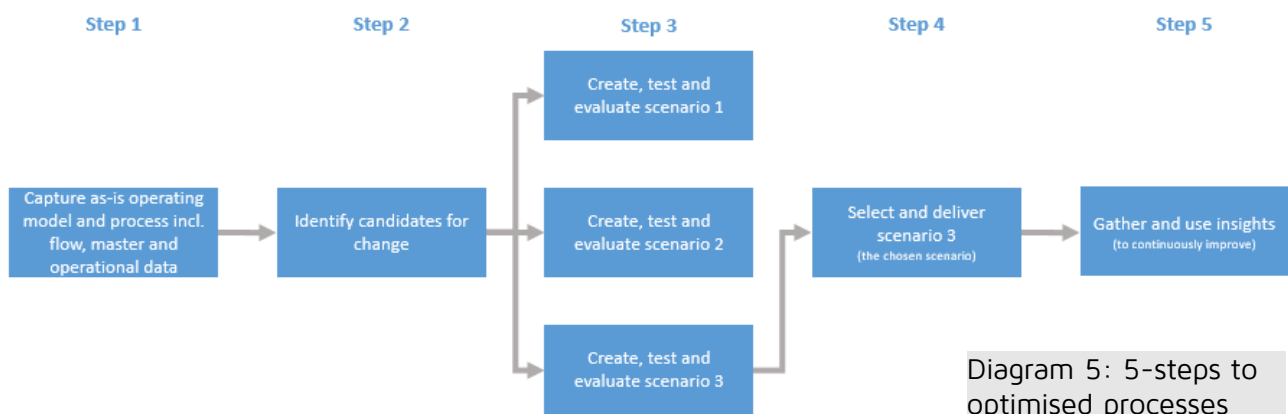


Diagram 5: 5-steps to optimised processes

STEP 1: CAPTURE AS-IS OPERATING MODEL AND PROCESSES

Start by capturing your current operating model and processes.

Your operating model may follow the traditional view (see diagram 6 below) or start as a set of functions or business areas that fit together to create the backbone of your operations (see diagram 7 on the next page).

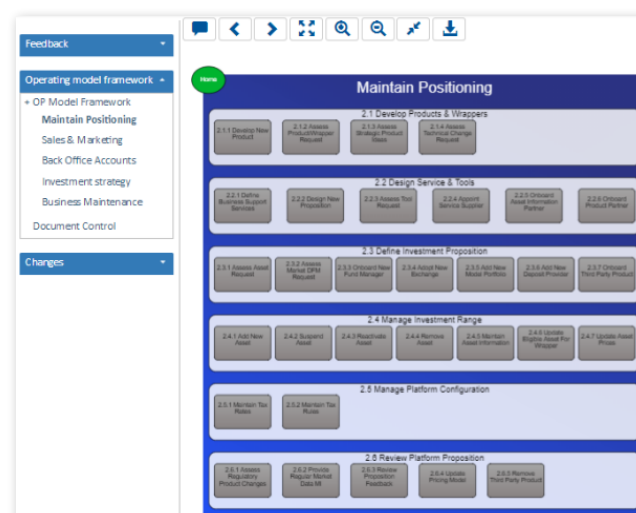
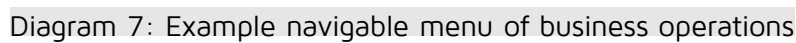
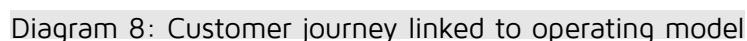


Diagram 6: Example Traditional Operating Model



A 3rd approach could be to start with a customer journey map. This customer focused view will help to pick-off the most important areas to your customers and link them back to your operating model – see below.



www.stratas.co.uk



Using process mining, Q&A forms or process diagramming tools (see diagrams 9, 10 and 11 below) flows, attributes, manual and system-based activities, organisation structure, resources used, timings, KPIs, financials, current performance metrics and resources (such as systems and people) can be captured and augmented to create a view of the current mode of operating (Digital Twin A).

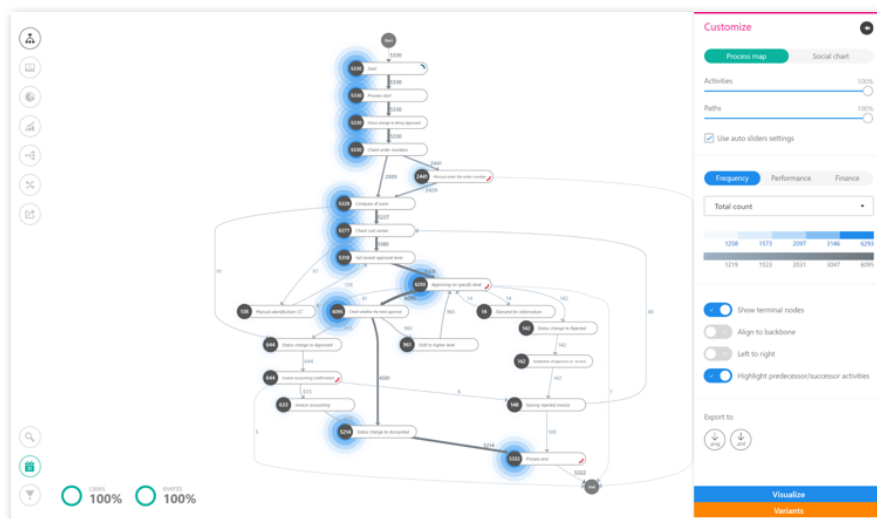


Diagram 9: Process mining

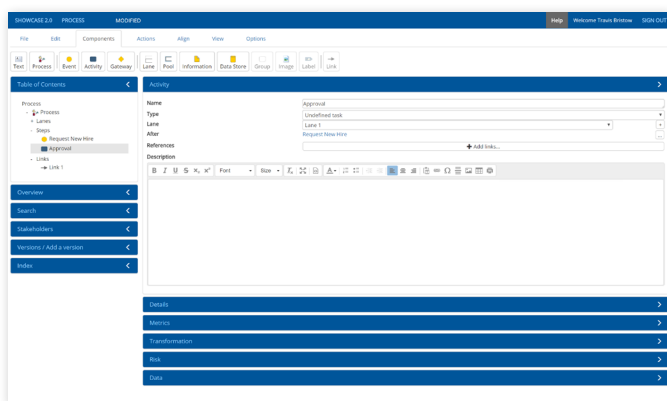


Diagram 10: Process capture form

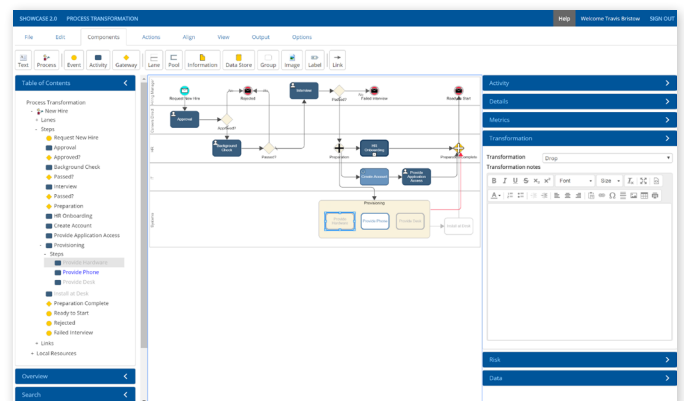


Diagram 11: Process diagramming tool

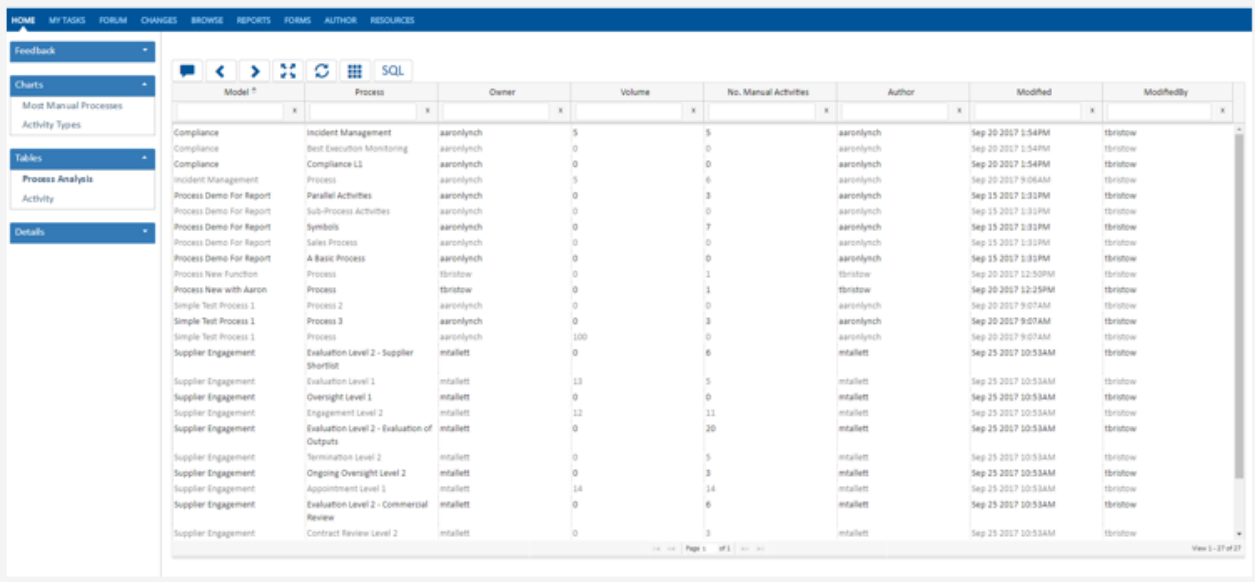
As a newer capability in the business process world, it is worth spending a moment delving into some details on process mining. Process mining provides a data-driven, fact-based approach that leverages empirical evidence to uncover how processes work in the real world. It uses data and insights generated from your event logs to identify constraints, prioritise improvement opportunities and pre-empt compliance and regulatory issues.

With a detailed visualisation of your actual processes (generated using process mining, manual investigation and wizards) you can see the paths and flows along with frequency, wait time, bottlenecks, exceptions/deviations, statistics, variances, costs, compliance issues, inconsistencies, etc.

From here you can investigate and identify problem areas such as staff training issues, system capacity, resource constraints, quality issues, poor process design, under staffing, staff rule breaking, missed compliance, inconsistencies, and so on. Using this data, you are ready to start identifying the primary candidates for creating the new digital twin (Twin B) of your operations.

STEP 2: IDENTIFY CANDIDATES FOR CHANGE

To create the future state twin, you need to identify a starting point. To do this use the captured processes and accompanying data to create a report that illustrates process types and performance - see diagram 12 below.



Model	Process	Owner	Volume	No. Manual Activities	Author	Modified	Modifiedby
Compliance	Incident Management	aaronlynch	5	3	aaronlynch	Sep 20 2017 1:54PM	fbirstow
Compliance	Best Execution Monitoring	aaronlynch	0	0	aaronlynch	Sep 20 2017 1:54PM	fbirstow
Compliance	Compliance LI	aaronlynch	0	0	aaronlynch	Sep 20 2017 1:54PM	fbirstow
Incident Management	Process	aaronlynch	5	6	aaronlynch	Sep 20 2017 9:06AM	fbirstow
Process Demo For Report	Parallel Activities	aaronlynch	0	3	aaronlynch	Sep 15 2017 1:31PM	fbirstow
Process Demo For Report	Sub-Process Activities	aaronlynch	0	0	aaronlynch	Sep 15 2017 1:31PM	fbirstow
Process Demo For Report	Symbols	aaronlynch	0	7	aaronlynch	Sep 15 2017 1:31PM	fbirstow
Process Demo For Report	Sales Process	aaronlynch	0	0	aaronlynch	Sep 15 2017 1:31PM	fbirstow
Process Demo For Report	A Basic Process	aaronlynch	0	0	aaronlynch	Sep 15 2017 1:31PM	fbirstow
Process New Function	Process	fbirstow	0	1	fbirstow	Sep 20 2017 12:50PM	fbirstow
Process New with Aaron	Process	fbirstow	0	1	fbirstow	Sep 20 2017 12:50PM	fbirstow
Simple Test Process 1	Process 2	aaronlynch	0	0	aaronlynch	Sep 20 2017 9:07AM	fbirstow
Simple Test Process 1	Process 3	aaronlynch	0	3	aaronlynch	Sep 20 2017 9:07AM	fbirstow
Simple Test Process 1	Process	aaronlynch	100	0	aaronlynch	Sep 20 2017 9:07AM	fbirstow
Supplier Engagement	Evaluation Level 2 - Supplier Shortlist	mtaliett	0	6	mtaliett	Sep 25 2017 10:53AM	fbirstow
Supplier Engagement	Evaluation Level 1	mtaliett	13	5	mtaliett	Sep 25 2017 10:53AM	fbirstow
Supplier Engagement	Oversight Level 1	mtaliett	0	0	mtaliett	Sep 25 2017 10:53AM	fbirstow
Supplier Engagement	Engagement Level 2	mtaliett	12	11	mtaliett	Sep 25 2017 10:53AM	fbirstow
Supplier Engagement	Evaluation Level 2 - Evaluation of Outputs	mtaliett	0	20	mtaliett	Sep 25 2017 10:53AM	fbirstow
Supplier Engagement	Termination Level 2	mtaliett	0	5	mtaliett	Sep 25 2017 10:53AM	fbirstow
Supplier Engagement	Ongoing Oversight Level 2	mtaliett	0	3	mtaliett	Sep 25 2017 10:53AM	fbirstow
Supplier Engagement	Appointment Level 1	mtaliett	14	14	mtaliett	Sep 25 2017 10:53AM	fbirstow
Supplier Engagement	Evaluation Level 2 - Commercial Review	mtaliett	0	6	mtaliett	Sep 25 2017 10:53AM	fbirstow
Supplier Engagement	Contract Review Level 2	mtaliett	0	2	mtaliett	Sep 25 2017 10:53AM	fbirstow

Diagram 12: Detailed view of process performance

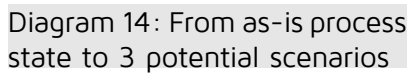
Through analysis of the report, identify and prioritise the candidate process or areas in processes that will best help achieve your goal. For instance, to drive up efficiency you may seek to identify manual steps that can be automated (see diagram 13 below), high lag time that can be reduced, or older non-performant systems that can be replaced.



Diagram 13: Report of ‘most manual processes’

Against the prioritised candidates set measures of success and KPIs that are tied to the goals listed earlier. This may mean that a single candidate is able to address all the goals, or makes a contribution that will be supported by work on other candidates as you progress.

Once candidate processes or activities have been prioritised, start creating future state scenarios that can be tested against the current mode of operation. Sample changes that you can introduce include rerouting flows, taking out or adding steps in, adding resources or automation etc. – see diagram 14 for sample scenarios below.



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STEP 4: SELECT AND DELIVER THE CHOSEN SCENARIO

With a view of the potential changes, measures of improvement, ROI and metrics should be reviewed to identify the potential impact of each (see diagram 15 below) before a final choice is made and implemented.

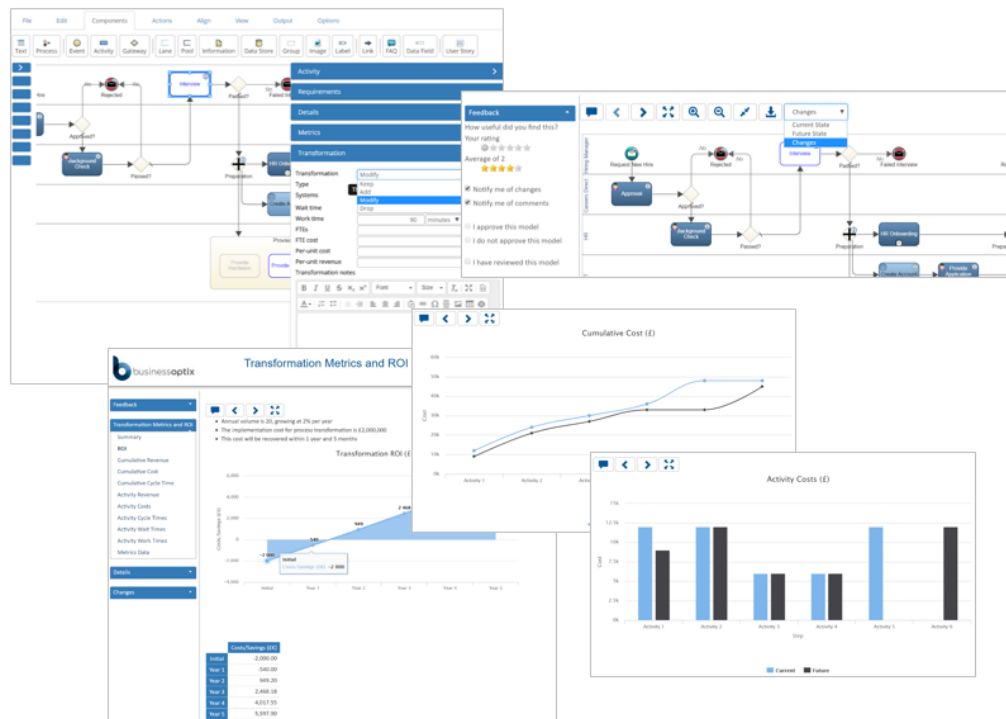


Diagram 15: Process metrics and ROI

To ensure speed and adaptability, implementation of changes should be run as controlled experiments before they are fully implemented. In this mode, while the tried and tested processes are fully operational you will be able to see the potential impact of each change. So if you think removing a step will improve efficiency or that automation will increase bandwidth, this can be tested and reviewed before making a final decision.

Through rounds of adjustment, trial and error you should arrive at a scenario that improves on the current situation and is ready for wider roll out. Detailed work can then begin on activities such as writing requirements or users stories (see diagram 16 below) for developers; creating manual and automated processes using BPM, RPA or case management; and generating work instructions (see diagram 17 on the next page), training materials and any regulatory guidance to support end users.

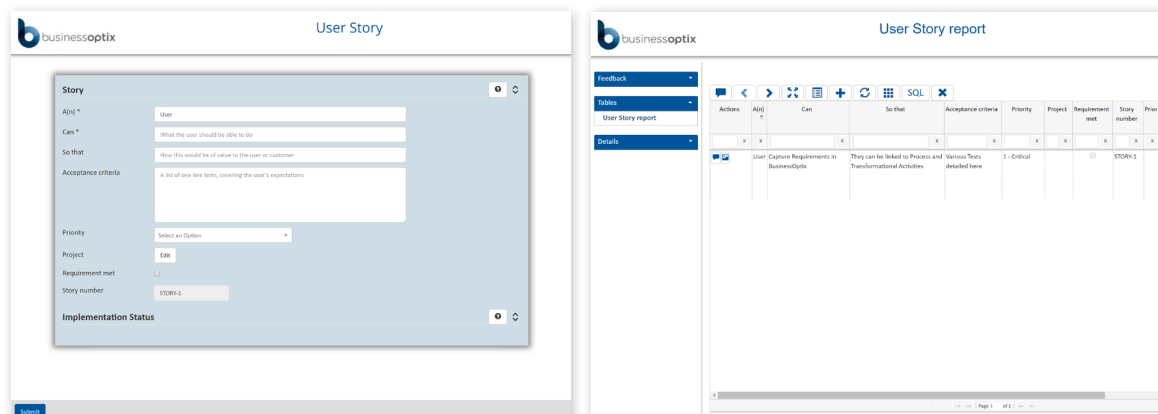


Diagram 16: User story capture and report

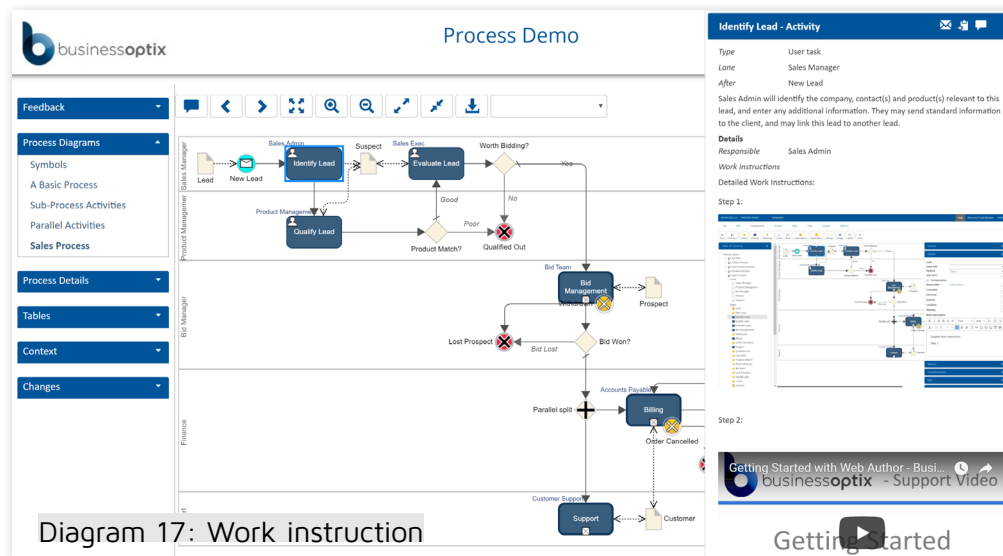


Diagram 17: Work instruction

STEP 5: GATHER AND USE INSIGHTS

Focusing on target goals, these need to be tracked via performance dashboards that provide a view of performance against key measures (such as cost, quality, service levels and resource utilisation).

While the performance dashboard will tell you how the process is doing against the metrics, continuous intelligence will be live and generate alerts or notifications off the back of specific performance SLAs that you set. For instance, if you set a 10 second target SLA for a process and this is running at 14 seconds an alert will be generated – on the grounds that this is an important part of your assessment when implementing your new scenarios and will be used to drive immediate or future corrective actions where required.

In guiding initiative outputs, use transformation maps (detailed above) to keep abreast of your plans, priorities and alignment to goals.

MOVING TO A NEW BUSINESS OPERATIONS AS USUAL

Returning to the digital twin once live, you will have a mode of working which means you can continuously repeat the cycle of capturing process performance, modelling scenarios, running experiments and using the learning to set the next course of action. For instance, in round 2 you will start with B (the outcome from round 1) and then move onto creating C, and so on and so forth round after round.

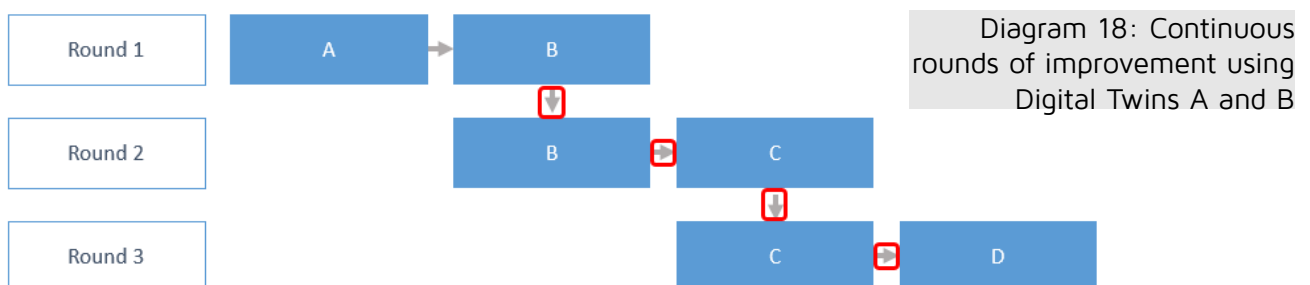


Diagram 18: Continuous rounds of improvement using Digital Twins A and B

New candidates can also be added to future rounds as you work through and connect the various parts that make your areas of focus. Not forgetting that this can be the start to creating a view of your existing and future operating model.



DATA FORGE, POWERED BY BUSINESOPTIX: ENABLING ORGANISATIONS TO USE BUSINESS OPERATING SYSTEMS TO DELIVER THEIR DIGITAL TWIN OF THE ORGANISATION

The BusinessOptix Process Transformation Platform supercharges the delivery of your digital twin.

Using our mining, mapping, design, modeling, simulation, documentation and planning capabilities, you can collaboratively improve your customer interactions, the way your employees work and the results your business achieves – all on a single platform that's rich in capabilities and easy to use.

BUSINESS DRIVERS	<p>To support understanding your business drivers and context, BusinessOptix can be used to:</p> <ul style="list-style-type: none"> → Capture data and insights from stakeholders → Outline your starting position using T-Maps
GOALS AND STRATEGY	<p>To support defining your goals, strategy and a plan of action, BusinessOptix can be used to:</p> <ul style="list-style-type: none"> → Draft and share your goals, business model and initiatives/workstreams using T-Maps and business modelling capabilities
STRATEGY EXECUTION	<p>To support executing your strategy, BusinessOptix can be used to:</p> <ul style="list-style-type: none"> → Capture as-is and to-be process models (directly linked to capability and operating models) using process mining, forms and diagramming tools to gather current process models and metrics and then to create requirements and user stories, manage master data, create comparative scenarios, and apply risk assessments and forward looking metrics → Score and prioritise process models → Apply regulatory compliance requirements and controls → Create operating and capability models, and customer journey maps → Document methodologies, frameworks and best practice guidance → Output process documentation and intranets to support end users (or XML for automation by BPM engines and RPA platforms) → Track progress at initiative and process levels
PERFORMANCE MANAGEMENT	<p>To support performance management, BusinessOptix can be used to:</p> <ul style="list-style-type: none"> → Track initiative and process metrics → Provide a real-time dashboard of initiative and process performance → Generate ad hoc and recurring reports on the whole initiative or specific processes
CONTINUOUS INTELLIGENCE	<p>To support operational management, BusinessOptix can be used to:</p> <ul style="list-style-type: none"> → Provide alerts and notifications when performance meets, exceeds or misses pre-set tolerances.
DECISION MAKING	<p>To support decision making BusinessOptix can be used to:</p> <ul style="list-style-type: none"> → Provide a management dashboard of key data points and insights.



FURTHER READING

BUSINESS OPTIX

- Successfully Transforming & Improving Business Operations Whitepaper - [Download](#)
- Business Change & Transformation – from strategy to execution – [Download](#)
- Enabling your business to run, grow and transform - [Download](#)
- How to use a T-map as part of your strategic planning process - [Download](#)

GARTNER

- "Market Guide for Technologies Supporting a DTO" by Marc Kerremans, 18 December 2019
- "Market Guide for Enterprise Business Process Analysis" by Marc Kerremans, Samantha Searle and Derek Miers, 19 November 2018
- "12 Powerful Use Cases for Creating a Digital Twin of Your Organisation" by Marc Kerremans, 25th October 2017

Gartner, Inc. "Market Guide for Technologies Supporting a DTO" by Marc Kerremans, 12th July, 2018

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Data Forge is a highly scalable and flexible platform which connects your existing systems to automate business processes. By piecing together market leading technology, Data Forge builds the perfect solution for your digital transformation.

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