

IMPROVEMENT SKILLS CONSULTING LTD.

“Simply, improvement...”



Simulation:
A world of “what if?”

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“Simulation: the key to business success.” [Gartner 2010]



Proving the benefits...

Whatever approach you take to improve performance, be it Lean, Six Sigma, Scenario Planning or basic problem solving, at some point you need to identify "new ways of working" and then implement these.





Sometimes there's a bit of a leap of faith and you have to make assumptions that the solution will be implementable and will indeed improve performance. In these cost-conscious times, it's even more important to improve your chances of success. That's why more organisations are turning to simulation, to "road test" their options and improve their chances of successful implementation.

Recently, we've been working with the UK's leading Agent Based Modelling expert, Dave Buxton ([dseConsulting](#)), looking at how simulation techniques can prove the benefits of proposed changes. In summary, some of the potential benefits of simulation are:

As an insurance policy:

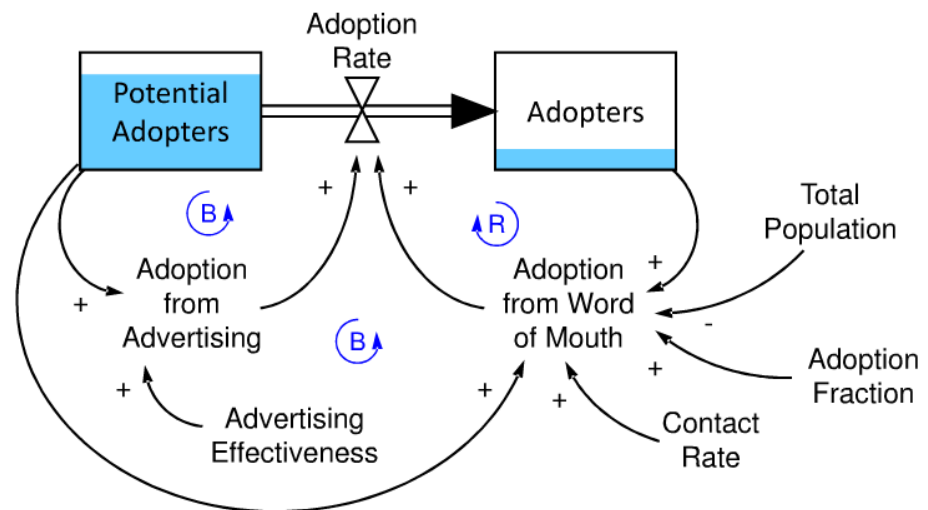
-  for large capital investment projects to ensure they work as envisaged
-  predicting realistic KPIs of future systems and refining plans and strategies

Testing alternative designs:

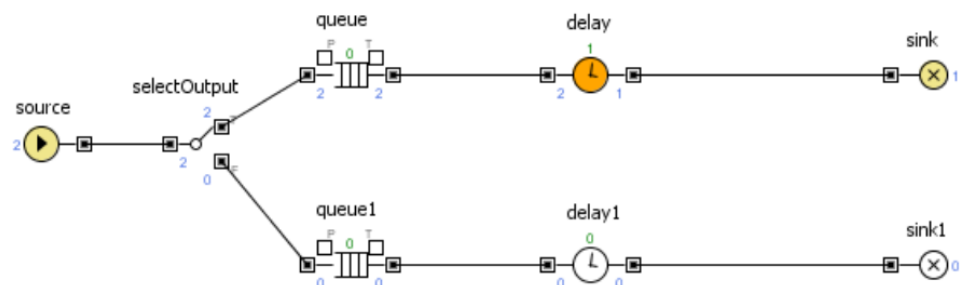
-  when testing in the real world is too expensive
-  when testing in the real world is too time-consuming
-  when testing in the real world is not possible (e.g. no existing infrastructure)
-  when testing in the real world is too risky

In its 2010 research, Gartner described simulation as the key to business success and there is obviously a range of simulation techniques available, so it helps to know which is most appropriate for your particular situation. Here are three:

System Dynamics (SD) takes a whole-system view and applies a structured approach to modelling a complex world. It is based on causal loop diagrams and feedback structures to describe mental models of how systems change over time. It uses the principles of stock and flow. SD is often used for answering large-scale strategic questions, but obtaining suitable data can be a problem with this type of model.







Discrete Event Simulation (DE) can help answer questions such as "how can our factory/office/operation double its capacity or throughput?". It is based on "entities" moving through a flowchart-based system and uses queuing theory based on arrival rates, delays and resource availability. This basic approach is applicable to hundreds of process systems where the interactions of processing time and delay can lead to a range of system performance problems. It is therefore highly applicable to Lean projects and has been used in situations such as banks, retail, transport, passengers, logistics and case management.



DE can't help you understand "why" people do or don't do things in a system, or how competitors might respond, or how customer behaviour might change demand in the future.

Agent Based Modelling and Simulation (ABMS) is used where there are large populations of "things" (agents) and is particularly useful where systems are people-centric, or heavily influenced by people's decisions and behaviours. It is based on "bottom-up" modelling, using an understanding of agents, decisions and states.

ABMS is useful for situations where:

-  there are multiple groups in a population, each of whom might behave differently
-  the past is not a good predictor of the future
-  the problem is complex and outcomes are difficult to predict
-  you need to assess the strategic results of business decisions (e.g. marketing or investment strategies)

Pareto:

Clearly, in the real world, things are complex and often lots of factors interact to create an outcome. Simulation helps us to understand this complexity and to be more confident in the impact of any proposed changes.

The "trick" lies in developing a model that is fit for purpose. The Pareto Principle certainly applies: a model that addresses 80% of the situation and has high face-validity resulting from high involvement of staff will be of far more use than trying to explain 100% of the variation with an overly complex "perfect" model.

So, if you have lots of process maps, Value Stream Maps or business and costing models on spreadsheets, but you aren't confident that these really "cut it" as far as improving decision-making is concerned, then simulation might just be a way forward.

Our track record

Our consultants have been helping organisations in the private and public sectors to manage and improve their performance for two decades. We are not wedded to a particular methodology or specific software tools. We help clients identify their improvement goals and then develop an approach to achieve these; invariably ensuring their people develop the skills to make further improvements themselves.

If you would like to find out more about how simulation can help you improve the quality of your decision-making, do get in touch. We would be pleased to show you a range of simulation options tailored to your business. Look out for details of our Simulation "taster" workshop.

Please contact us for more information about how we can help you increase your capability to manage and improve your organisation's performance through the use of simulation.

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