"Digital Twin" Business Models

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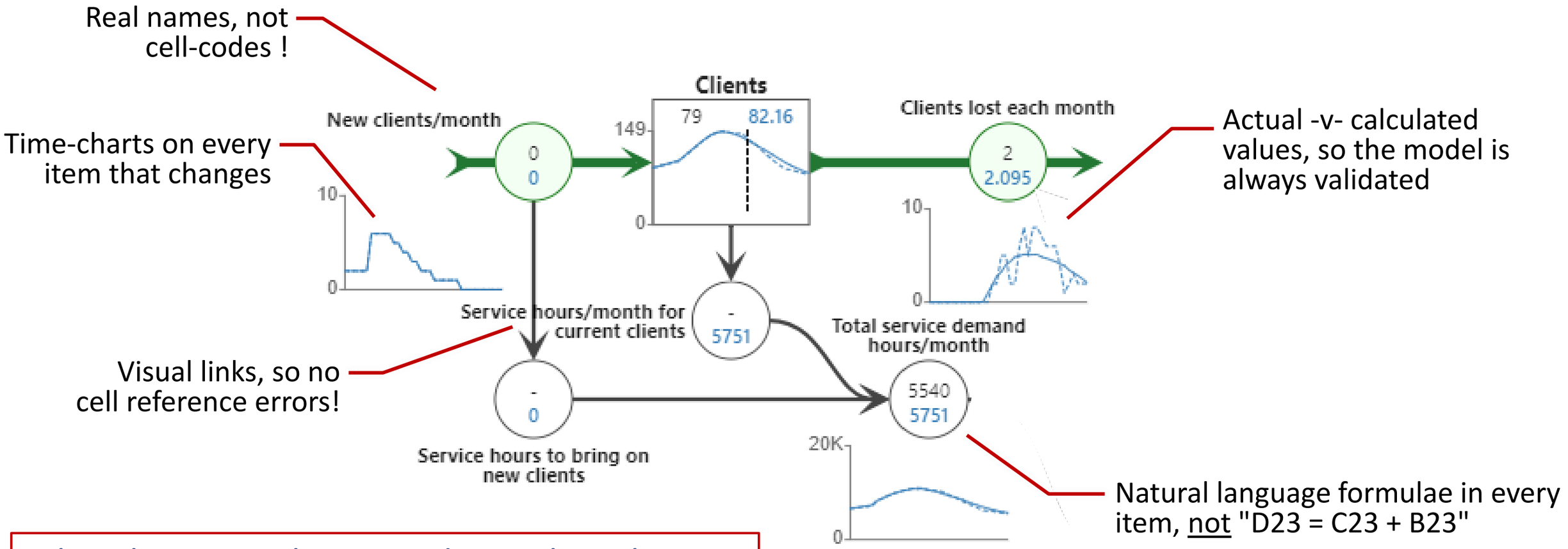
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For new-comers …

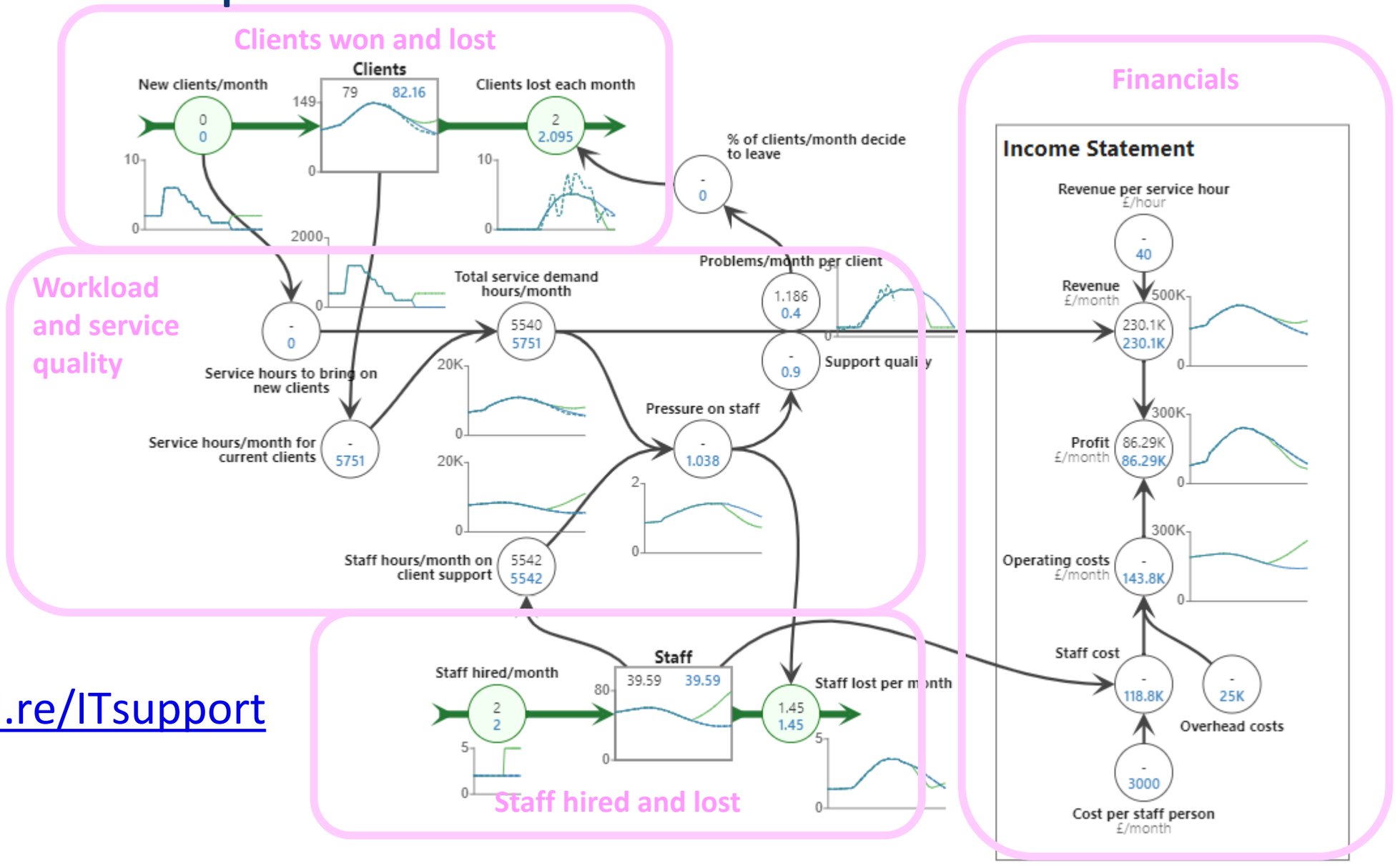
System Dynamics models simulate, quantitatively, how elements in a system (for a business - customers, sales, profits, service-quality, staff skills …) change over time, reflecting the interdependencies between them.

A system dynamics model -v- a spreadsheet …



… but there is nothing weird or technical going on. Think of each item as a spreadsheet column, and each link as a cell-reference.

An example of a simple IT-support business model, with interdependencies and feedback.



See sdl.re/ITsupport

System Dynamics models common purposes …

… to solve *one-off challenges – fixing poor service, fighting off a competitor …*

… to set up *longer-term plans – a business plan, or a staffing or marketing strategy etc.*

But they can do *more* …

… mimic the *continuing performance* of an organisation, department or on-going issue (as a "Digital Twin")

… to guide operational and strategic *decision-making*

A true, engineering Digital Twin …

" … a *digital replica* of potential and actual physical assets, processes, people, places, systems and devices … provides both *the elements* and *the dynamics* of how a device operates and lives throughout its life cycle. Two important characteristics:

1. the *connection* between the physical model and the corresponding virtual model
2. this connection is established by *real-time data* from sensors."

A Digital Twin for management … replace "device" with "organisation"

" … a *digital replica* of potential and actual ~~physical~~ *organisational* assets processes, people, places, systems ~~and devices~~ … provides both *the elements* and *the dynamics* of how ~~a device~~ *an organisation, department or issue* operates *continually* ~~and lives throughout its life cycle~~. Two important characteristics:

1. the ~~*connection*~~ *correspondence* between the ~~physical model~~ *organisation's real-world elements* and the virtual model
2. this connection is established by *real-time data* from ~~sensors~~ *organisational reporting systems*"

We do not need to capture every transaction, (*every person hired/fired, every customer purchase, every item ordered* …) to get most of the benefits – fast and easily.

Management Digital-Twin *illustration* …

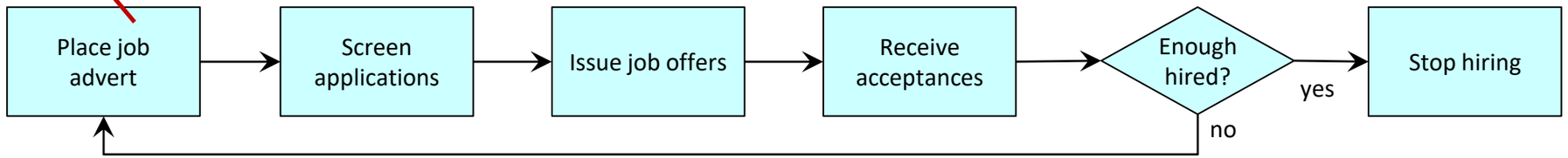
1. start from a minimal *staff-hiring process* model, with short time-units (*days*)

2. staffing levels are driven by demand for *customer-support*

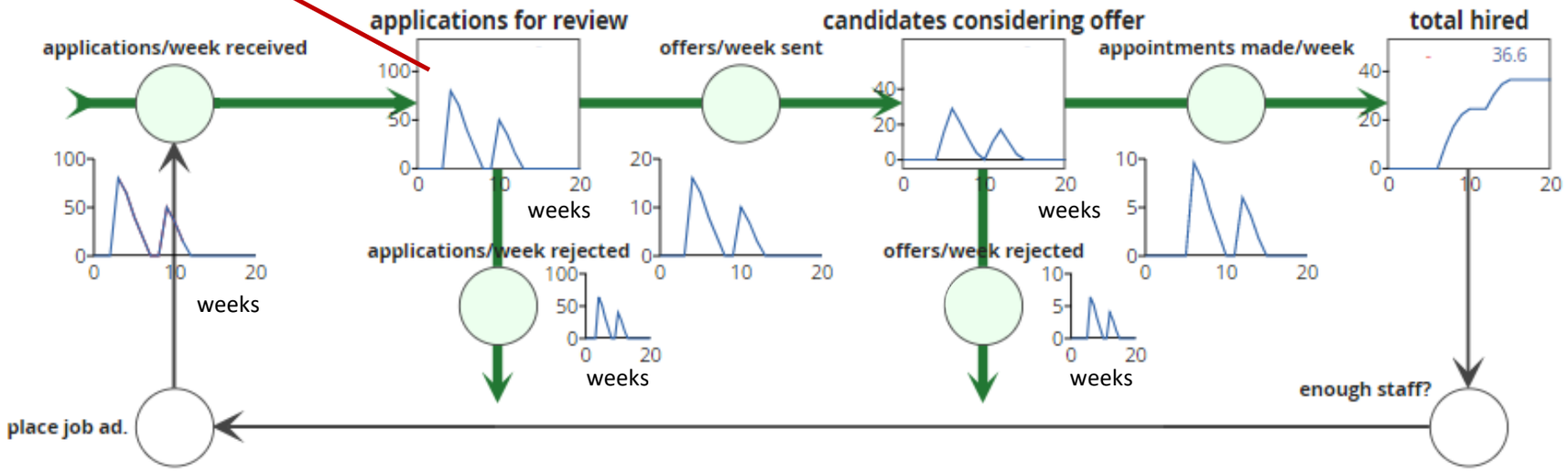
3. … leads to a potential *Digital Twin* for staffing management, both *operational* (*short-term*) and *strategic* (*long-term*)

Many (most?) managers think "model" = process mapping … so what is the connection?

the activities that are *done* to the 'things' in the system … *qualitative*, ***verbs*** !



how *the numbers of 'things' themselves* change over time … *quantitative*, ***nouns*** !



Try this 20-week hiring campaign yourself at sdl.re/HiringProcess

Demonstration – an insurance business need for customer-support staff …

The business has ~500,000 *customers*

… a % of customers *call each month*

… *support-staff* handle daily calls

… under-staffing causes *overload* and more-than-normal *lost customers*

… a staff shortage triggers *a hiring process*

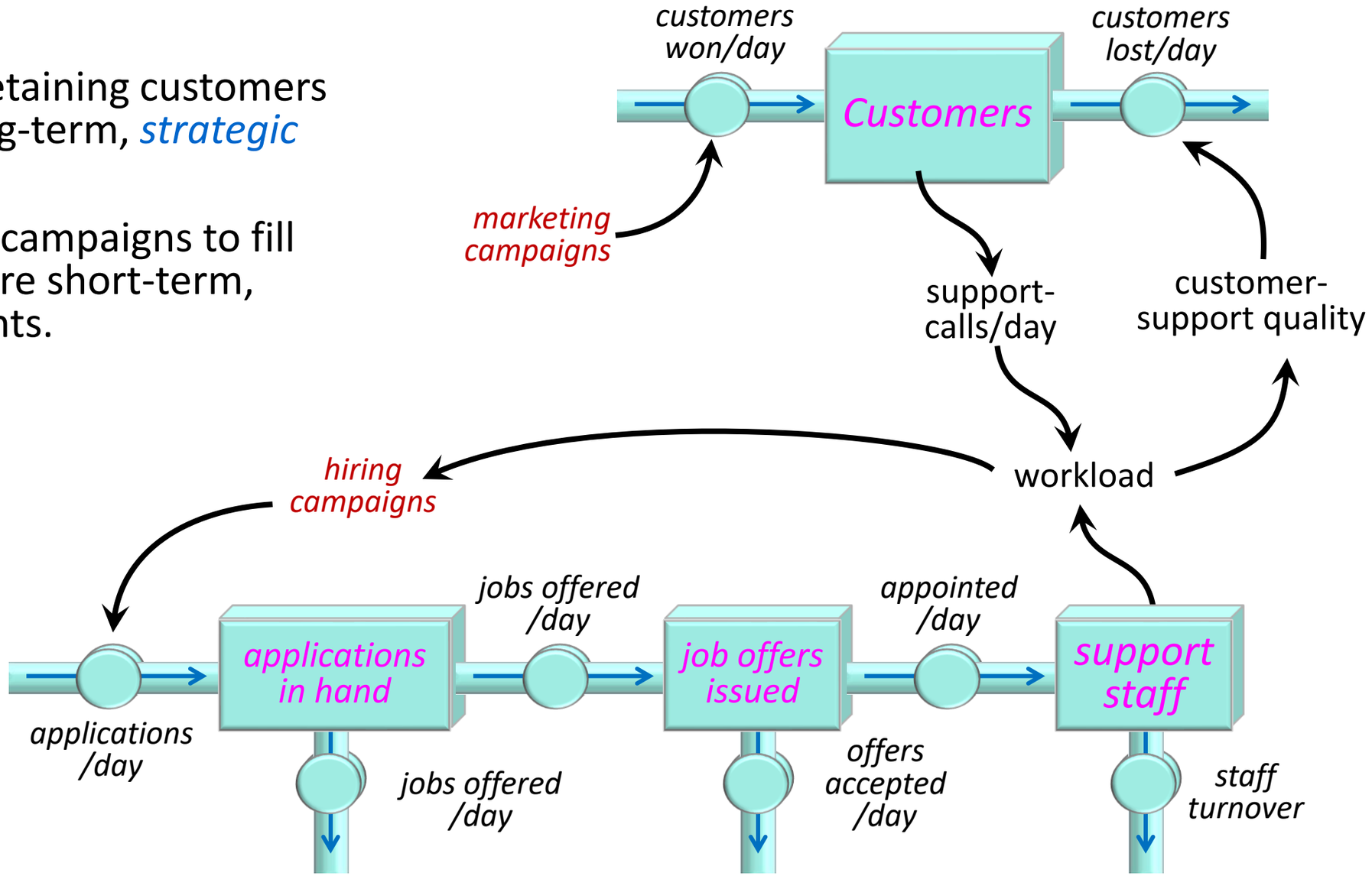
… the staff target can include a *% uplift* to handle *peak call-rates*

And we may need optional *extra hiring* episodes

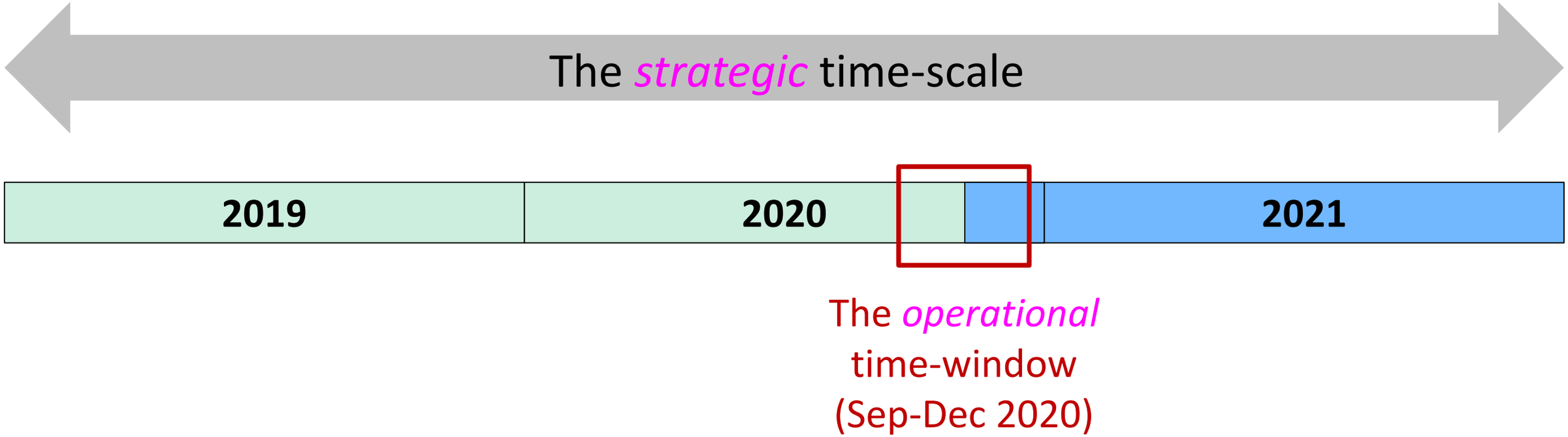
The structure of the staffing challenge …

Capturing and retaining customers and staff are long-term, *strategic* challenges

… but the hiring campaigns to fill staff shortages are short-term, *operational* events.



The operational -v- strategic view of customer-support staffing



Operational planning for a marketing campaign coming soon

the campaign is expected to bring in 40,000 new customers

~ 200 customers/day are lost for other reasons

but *more* customers are lost/day when calls exceed peak capacity

(*we avoid over-staffing to limit costs*)



the marketing campaign will trigger *more* customer losses, more often

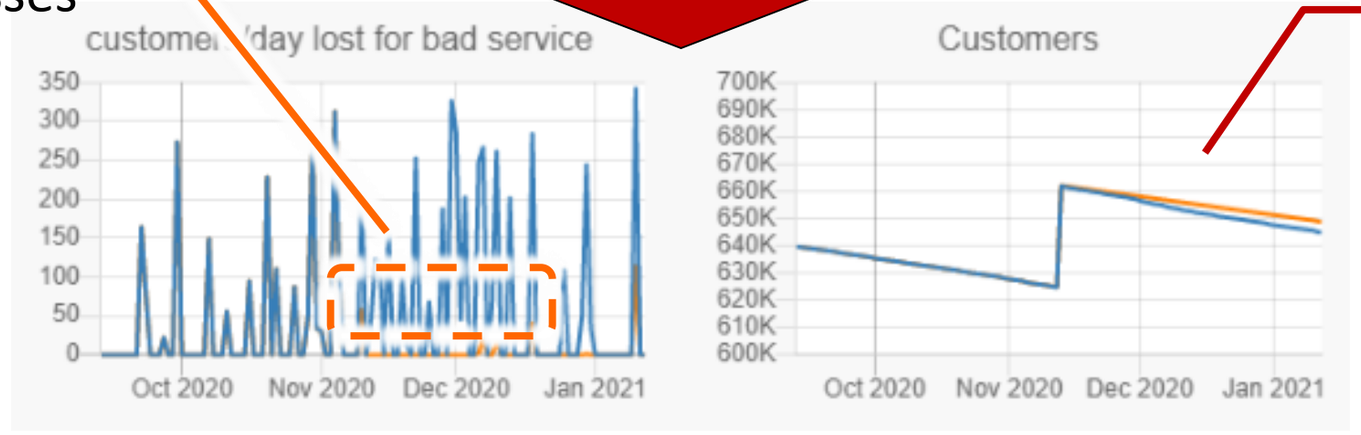
… until workload-driven hiring catches up with higher call-rates

To avoid work overload and high customer-losses, test a short-term hiring campaign …

daily progress of applicants through the hiring process



the higher staffing cuts the excess customer losses

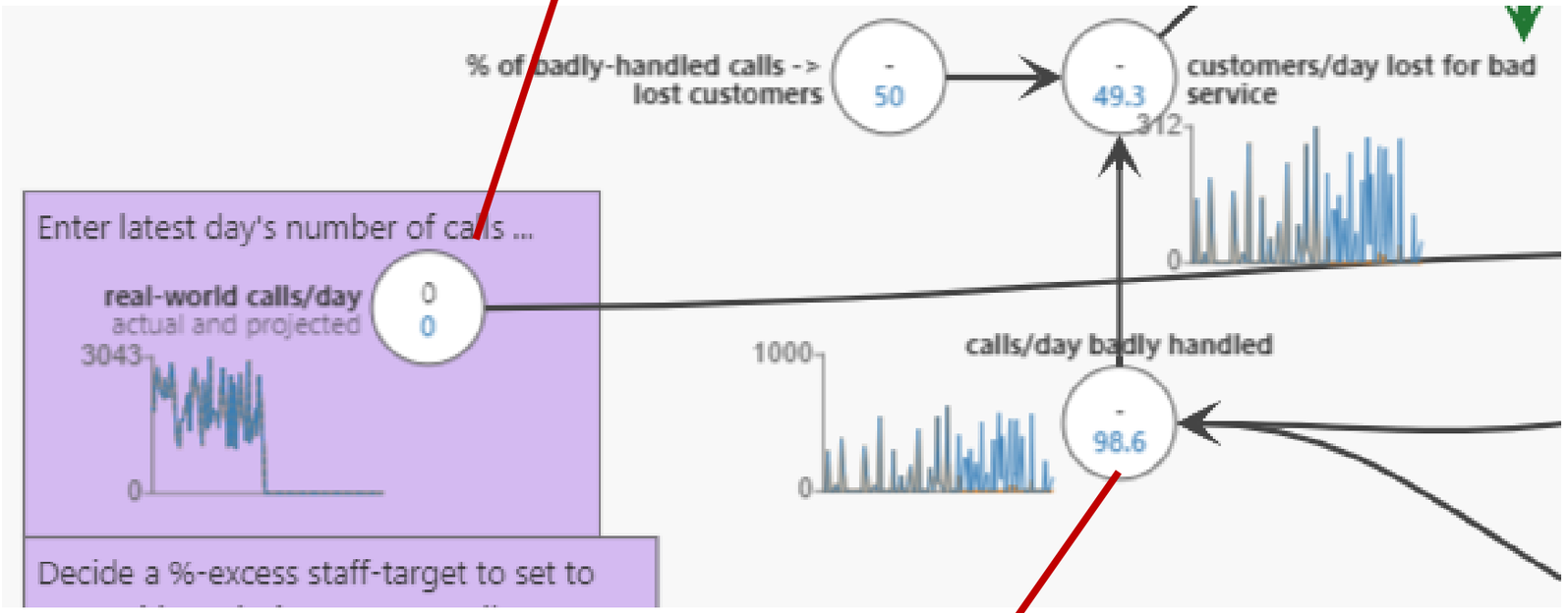


… and we retain more of the customers won by the campaign

Get this model at
sdl.re/StaffingDigitalTwin

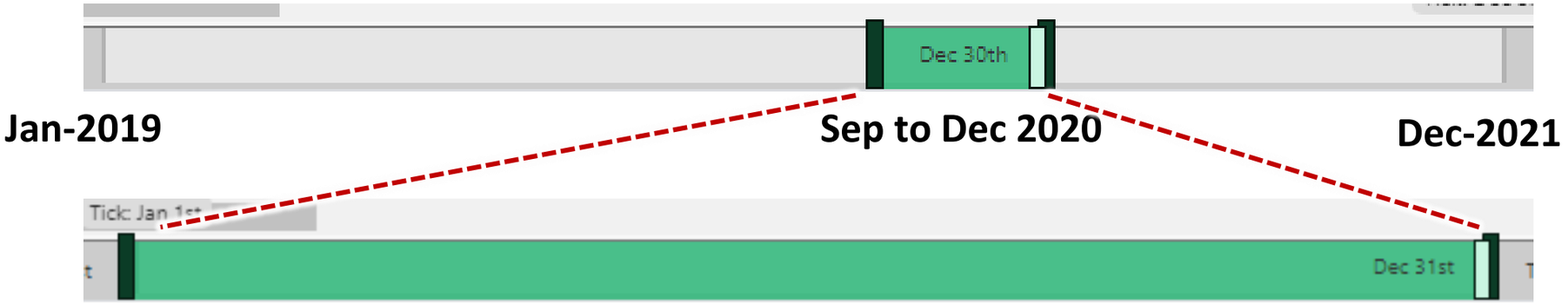
In practice, update daily the number of customer calls

This object holds real-world values for the number of daily calls

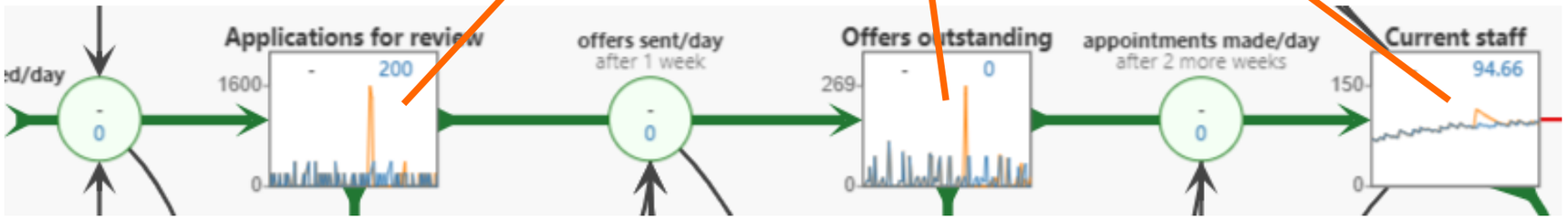


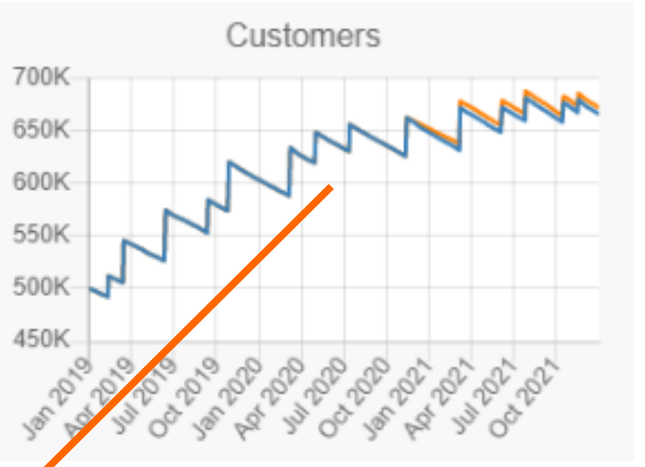
The number of badly-handled calls could also be tracked alongside simulated estimates for that number

Change from a short-term to a strategic view of the same staffing challenge …



that hiring campaign is a 'blip'





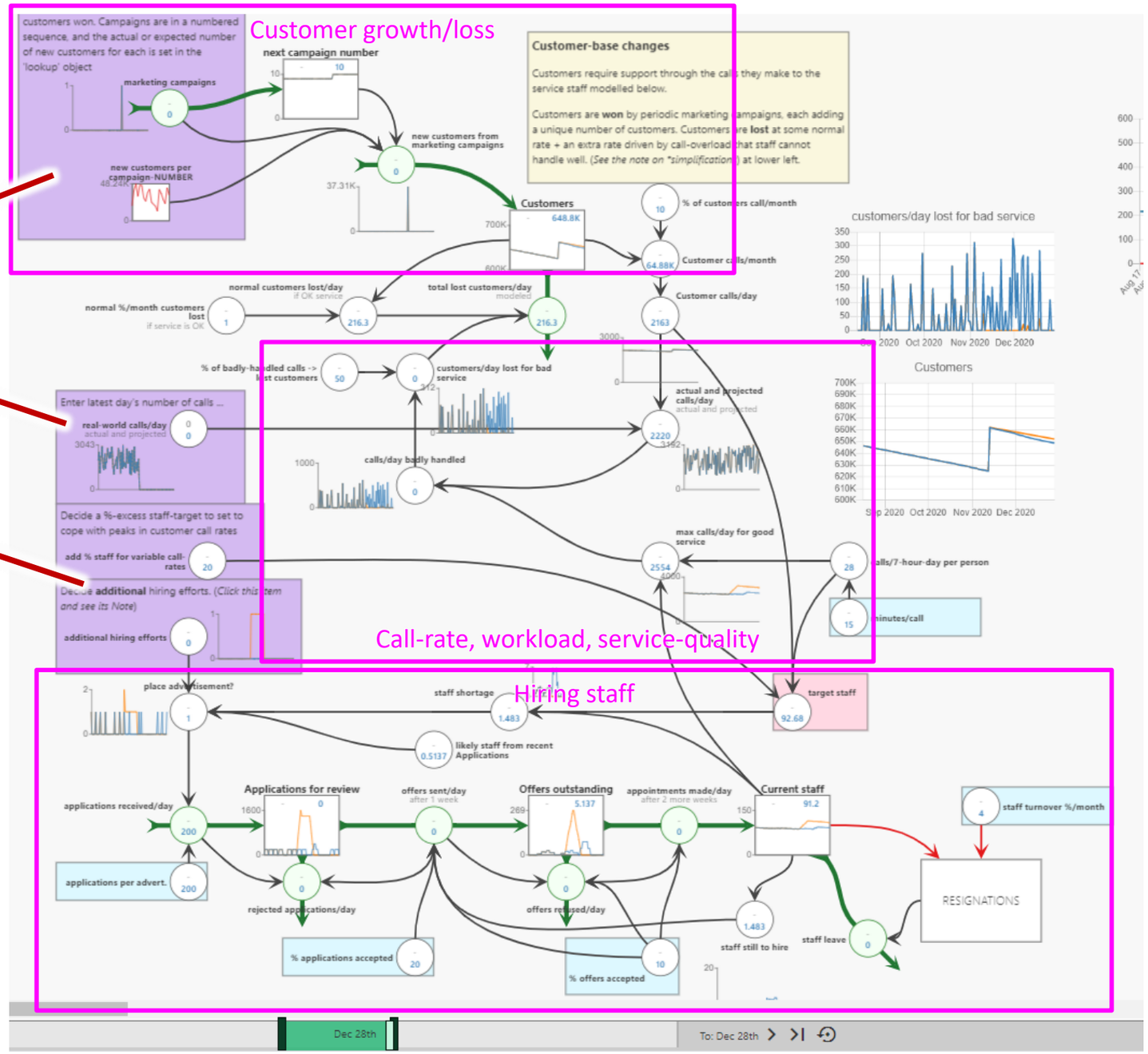
but the retained customers carry over …

The full model …

Set marketing campaigns timing and customers-won

Update daily calls-received

Set staffing uplift and additional hiring efforts



Get this model at
sdl.re/StaffingDigitalTwin

Simplifications in this example-model …

… hired staff *start* immediately, with no notice-period

… no initial *training time*

… marketing events bring a *one-time pulse* of new customers (*campaigns would run for some time and bring in a stream of daily new-customers*)

… no *week-day/weekend* distinctions etc.

All these features and others are easily modified to match how the real-world system works.

From strategy/policy models to digital-twins

Normal system dynamics principles apply

… but with very short *time-units*

… *"processes"* may need to be explicit - *hiring, customer-acquisition, supply-chain etc*.

… there may be "*small-number*" issues *e.g. zero or few staff hired or leave on any day*

… "zoom" the time-scale to provide *operational and strategic* insights

NOTE: *These issues also apply in non-profit and public sector cases, and equivalent models are equally useful.*

The fast, reliable AgileSD 4-step process
(*differs from conventional methods, see* sdl.re/AgileSD)

1. Time-chart the desired outcomes (*and history*)

   "*what causes those outcomes?*"

2. Find, specify, quantify the "stocks" of resources driving those outcomes (*customers drive sales; staff drive service support, etc …*)

3. Quantify the rate of gains and losses causing those resource-stocks to grow or decline

   "*what causes those gains and losses?*"

4. Find, specify, quantify the other resource-stocks causing those gains and losses

… repeat until satisfied

Simple, concrete – "*I can calculate A from B and C*"

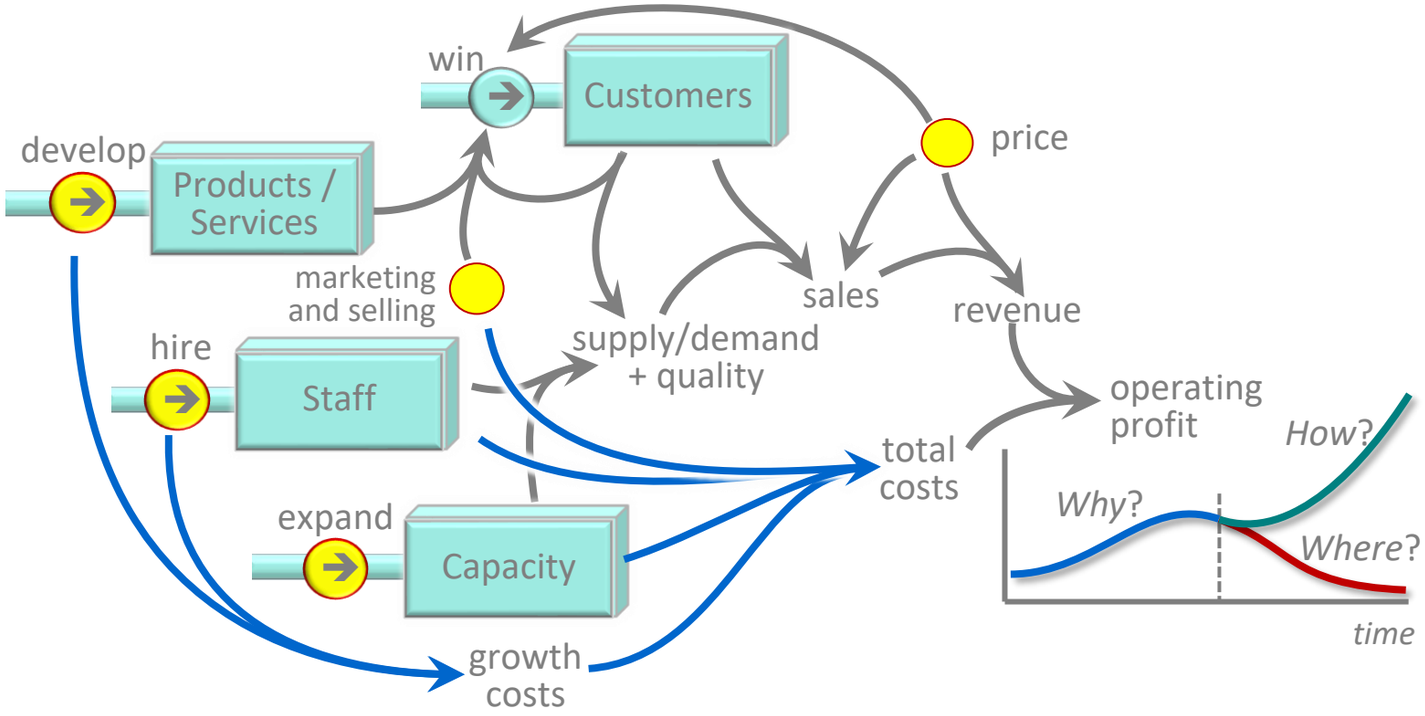
A universal feature of all real-world systems

add a highly visual, quantifying simulation tool

… a living, dynamic (time-based) model that mimics the real-world system and its behaviour

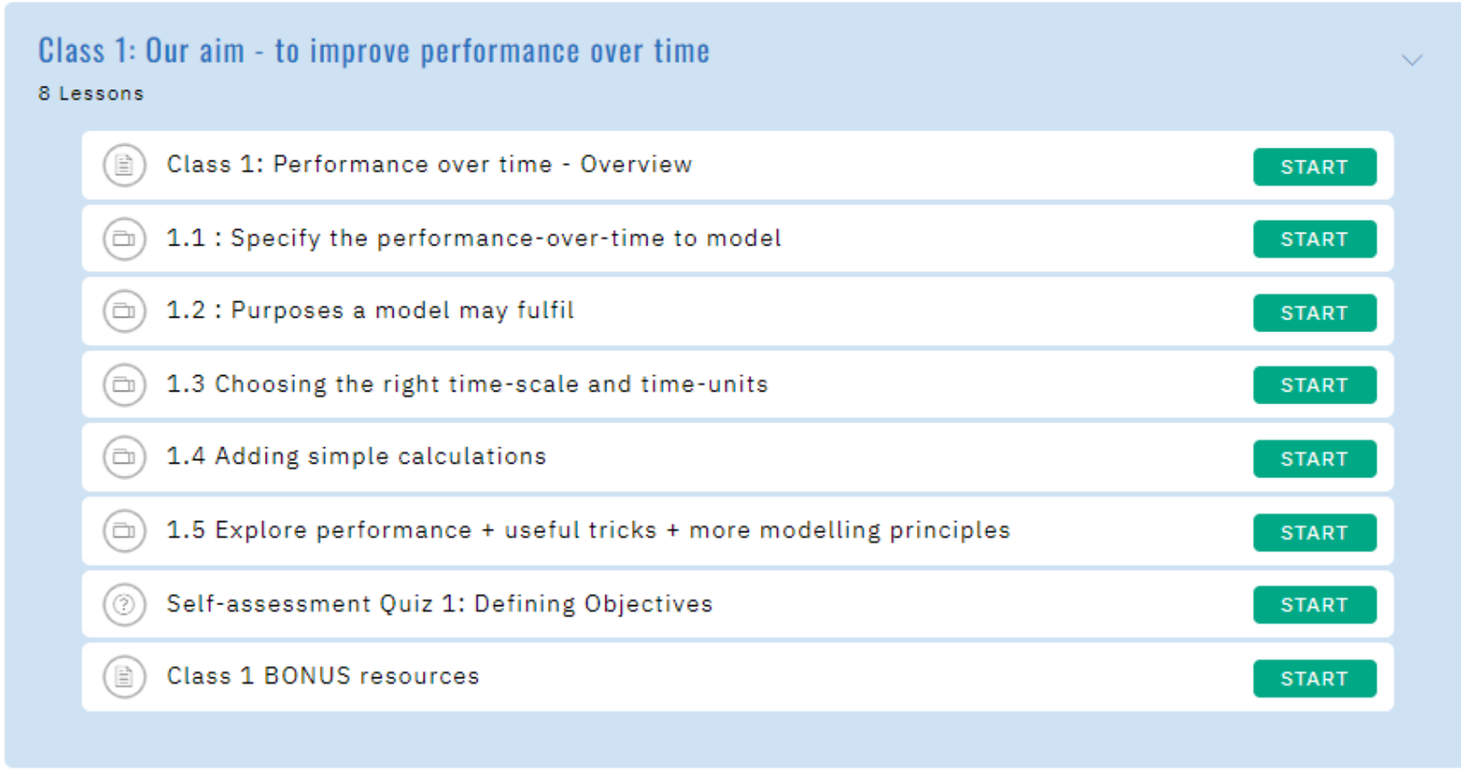
Take the Dynamic Business Modelling core course…

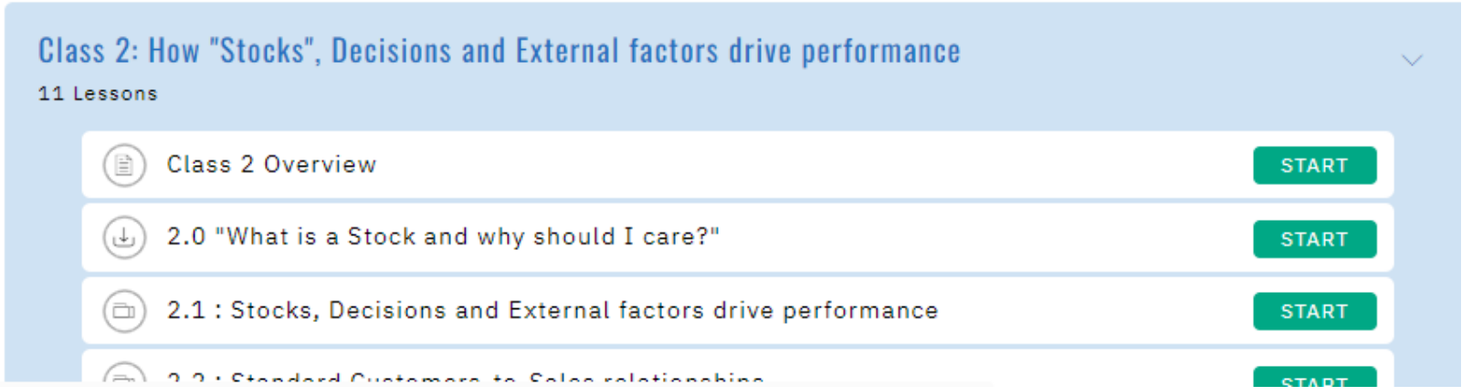
Learn how to build dynamic models for many purposes, and how to model a whole business.



A self-paced course to fit around your other time commitments and priorities.

The Dynamic Business Modeling core course …





What you get …

4 core classes of 26 lessons

6 hours of slide-show video + PDFs

… with "follow me" demos

Varied examples and ready-to-use models

The Silico app

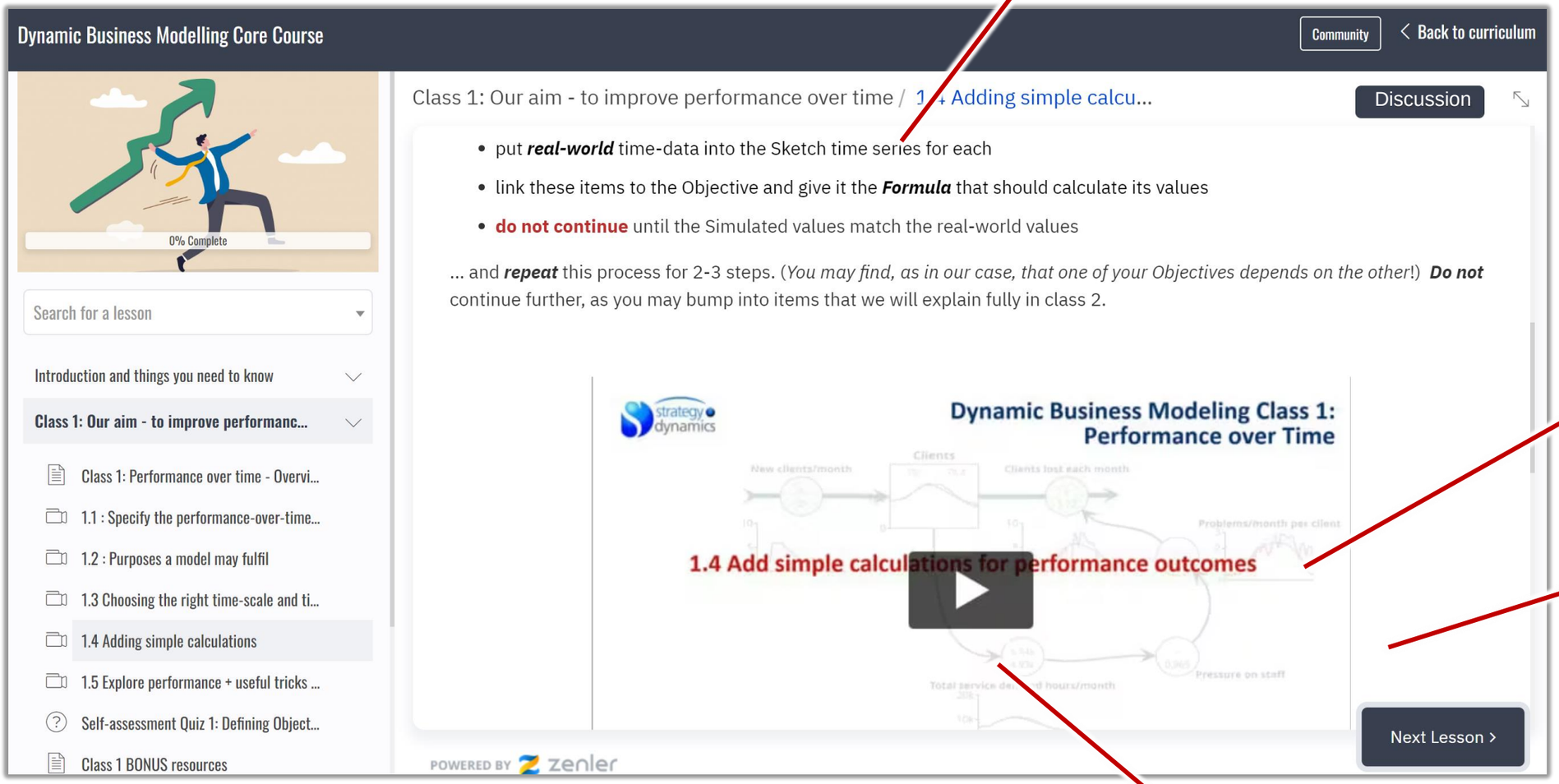
+ built-in bonuses …

Discussion threads for Q&A

Self-assessment quizzes

Course details: sdl.re/BMcore

Inside each lesson …



Summary of what to do

Slide-show video and demos

How to start on your own cases

Including links to working models that you can keep and use

"Digital Twin" Business Models

Q & A

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