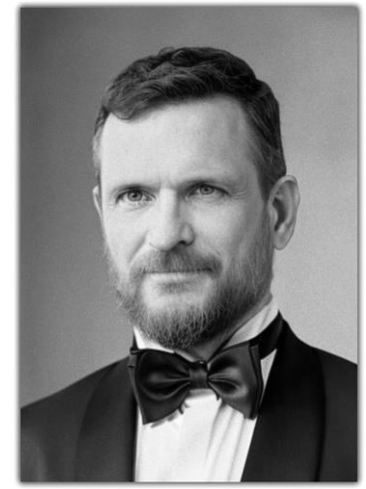
Alexey Blyakhin

Kitties Engineers:
Theory of Constraints

Alexey Blyakhin, a skilled individual with a background in physics, expertly combines scientific knowledge and technical expertise with a profound understanding of finance infosystems. He has developed innovative banking and payment systems now employed by major banks in the Baltics.



Aleksei is also deeply involved in psychology, being the author of a series of lectures on psychoanalysis.

Additionally, he showcases his musical talent by performing as a baritone and serving both as the author and presenter of concert-lectures on classical music. Outside of work, he is a devoted family man and father of three, finding joy in life's simple pleasures and cherishing family warmth.

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All illustrations in this book were prepared by the artificial intelligence ChatGPT4 + DALL*E 3.

You can purchase this book in electronic format, as well as in hardcover with the author's autograph, on the website

kitties.duoclassico.eu

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Acknowledgements

At the very heart of this journey lies the unwavering support of my wife, Natalya. Her belief in my visions has been the bedrock upon which this work stands. Her strength has shone brightly as a beacon during times of uncertainty and weariness, and her constant encouragement has carried me through.

To my children, Maria, Andrey, and Anastasia, my gratitude is boundless. Your dedication to bringing the world of Kitties Engineers to life through your vibrant illustrations has given this book its soul. Each stroke of your brushes has translated the intricate Theory of Constraints into a language that speaks directly to the reader's imagination.

I must also pay tribute to my friends and colleagues, whose perceptive critiques and suggestions were instrumental in refining this manuscript. Your patience, commitment, and support have been pillars of strength. The book's evolution has been significantly influenced by our collaborative discussions and your valuable insights.

Foreword

Dear readers,

We are delighted to invite you into the intriguing world of the "Kitties Engineers: Theory of Constraints". This distinctive book demystifies the complex principles of TOC with a series of compelling comics, where charming kitties elucidate these concepts with both wit and clarity.

Eliyahu Goldratt's seminal work *The Goal*, first published in 1984, introduced TOC as a revolutionary management philosophy focused on pinpointing and addressing the bottlenecks that prevent systems from achieving their full potential. Our publication pays homage to Goldratt's groundbreaking ideas by presenting them through industrial-themed narratives, and, although our feline engineers may add an element of charm, the insights they offer are as profound and actionable as those found in the original text.

While the examples we've chosen are rooted in the construction industry, the strategies and lessons are universally applicable across various organisational contexts.

Rest assured, our furry friends are here to guide you safely and soundly through the learning process—no actual kitties faced any quandaries during the creation of this book.

So, settle in with a cozy beverage of your choice, and let's embark on a captivating educational adventure with the Kitties Engineers.

Warm regards,

Alexey Blyakhin

This story could happen in any organisation, not necessarily a construction one...

Ladies and gentlemen, as we stand on the brink of the new financial year, let's embrace the certainty that the commercial landscape is a tapestry of relentless transformation.

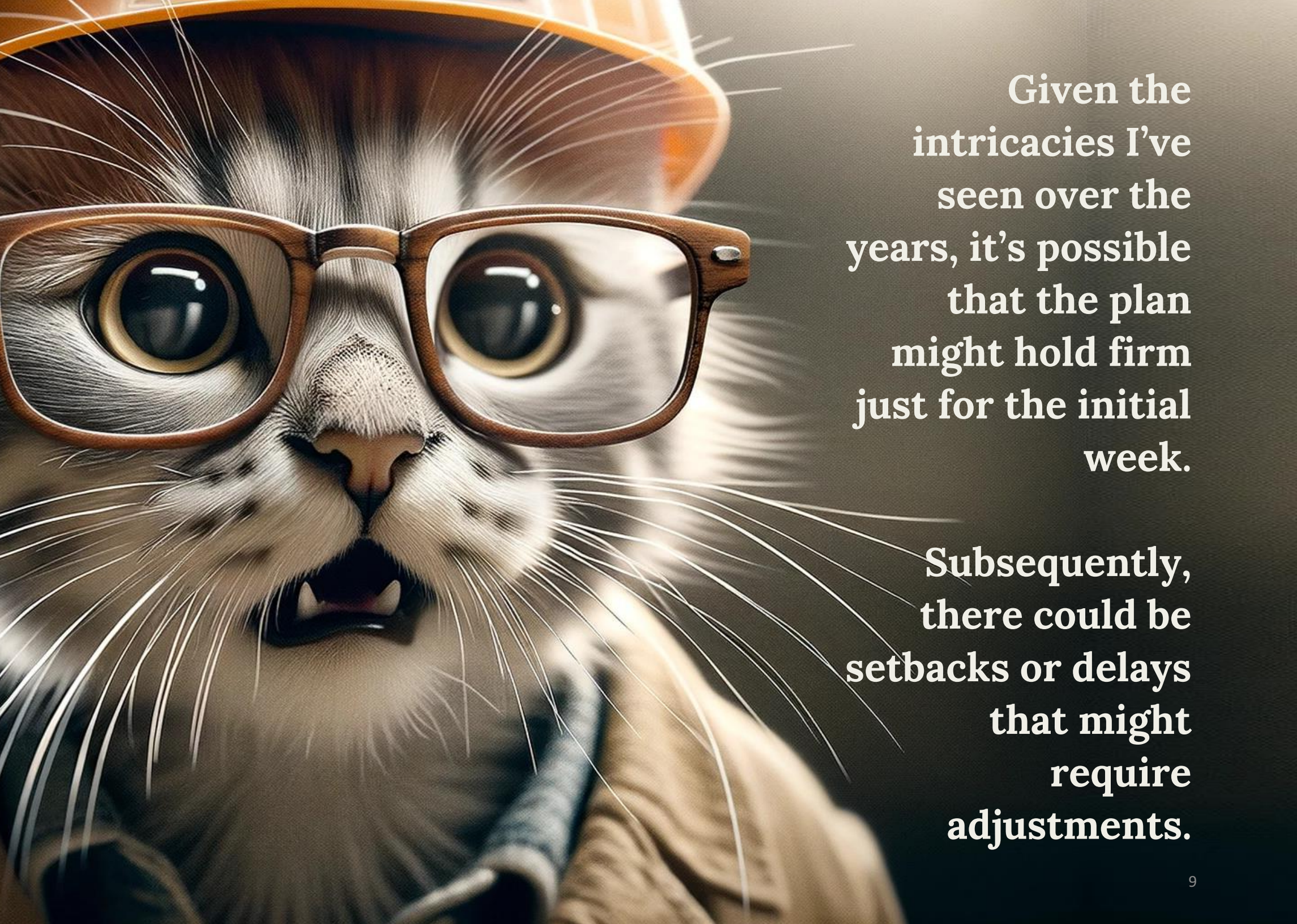
Our strategic map may not yet be fully drawn, but the compass handed down from our distinguished senior management steers us with unwavering conviction.
It is time to boldly align our performance indicators with the lighthouse of our ultimate ambitions.

Absolutely, our preparations for the forthcoming year, especially Q1, are underway with great momentum.

The game plan will pivot around the directives from our sales team, always with a keen eye on client requisites.

We’re committed to a holistic approach – analysing builders’ efficiency, the efficacy of the architectural department, and ensuring alignment with our Legal and Finance colleagues.

This cycle, our allegiance to the plan will be unyielding, championing methodical workflows and fostering team solidarity.



Given the intricacies I've seen over the years, it's possible that the plan might hold firm just for the initial week.

Subsequently, there could be setbacks or delays that might require adjustments.

Bet your bottom dollar, by the time week three rolls around, the only thing in common between that plan and reality will be the fancy name on the cover!


Wait, what?
No plan?
How am I
supposed
to get
my paints
ordered?

Look, let’s handle this the way we always have.

We’ll create a dedicated war room. Several times a week, we’ll gather, go over our projects, tackle any blockages, and set our priorities straight.

By the way, is anyone clued in on the status of Project <unintelligible>?

Everything is going exactly according to the plan. There are some minor difficulties, but we will definitely finish in two or three weeks.

Could you remind me how long it generally took to lay a brick in the last quarter?

Oh, it’s been... well, decreasing, you see?

Crikey! Shut that camera off!

From the author:

I would like to draw your attention to a particular detail. All the illustrations in this book have been generated by artificial intelligence ChatGPT-4 + DALL*E based on descriptions.

For instance, the image on the previous page was created using the following description:

```
A wide photorealistic illustration. The construction kitten sits at a desk in a room.
His face has a slightly flustered expression, realising that everyone can see him
with his wife during the video call. His ears are not pressed down by the helmet,
giving him a more relaxed and natural appearance. His wife, with a cheerful
expression and a bow on her head, approaches from behind, placing one paw on his
shoulder. She wears a playful light dress adorned with lace details. The background
shows a part of the room, emphasising the home setting. The mood captures the
unexpected and light-hearted moment of working from home.
```

Take a closer look at the kitten's eyes; do you notice anything in them? Something is reflected there.
It's the laptop screen with an application open on it.
Overall, artificial intelligence knows much more than we think.

And another point. To tell this story, five or six cats would be enough. However, at the time of writing this book, October - November 2023, the artificial intelligence DALL·E could only generate images based on descriptions and not from another image. Therefore, it was impossible to draw the same cat in different situations.

Each time, even when I provided the exact same description, the cats still turned out slightly different.

Here, for example, are the different kinds of kittens that can be obtained from the same description. That's why there are so many different cats in this book.

However, let's get back to our story.

Brilliant!

Our system's chugging along nicely!

But why on earth aren't we scaling up to double, triple, or, heavens above, quintuple our output?


Hey buddy, how can one get a cow to chow down less but still produce more milk?


*aside and
in a half-whisper
It’s a doddle, pal.
Cut back on her
feed and milk her
more often!


I’ve got this niggling feeling that there’s always a constraint in any system...
...if not, it would zoom off at light speed.

Bottlebrush...
Bottlefly...
Ah, dear colleagues, here's the correct term: bottleneck!

A bottleneck is any resource, activity, or policy that restricts the output or performance of a system.

Oh! Speaking of systems without bottlenecks!

Really now?

Picture this: a charming museum in a sleepy town, a chilly winter morning during the week.

The museum is welcoming, all the staff are in their places, yet there’s barely a visitor.

Perfect!

Is there a queue at the ticket office there?

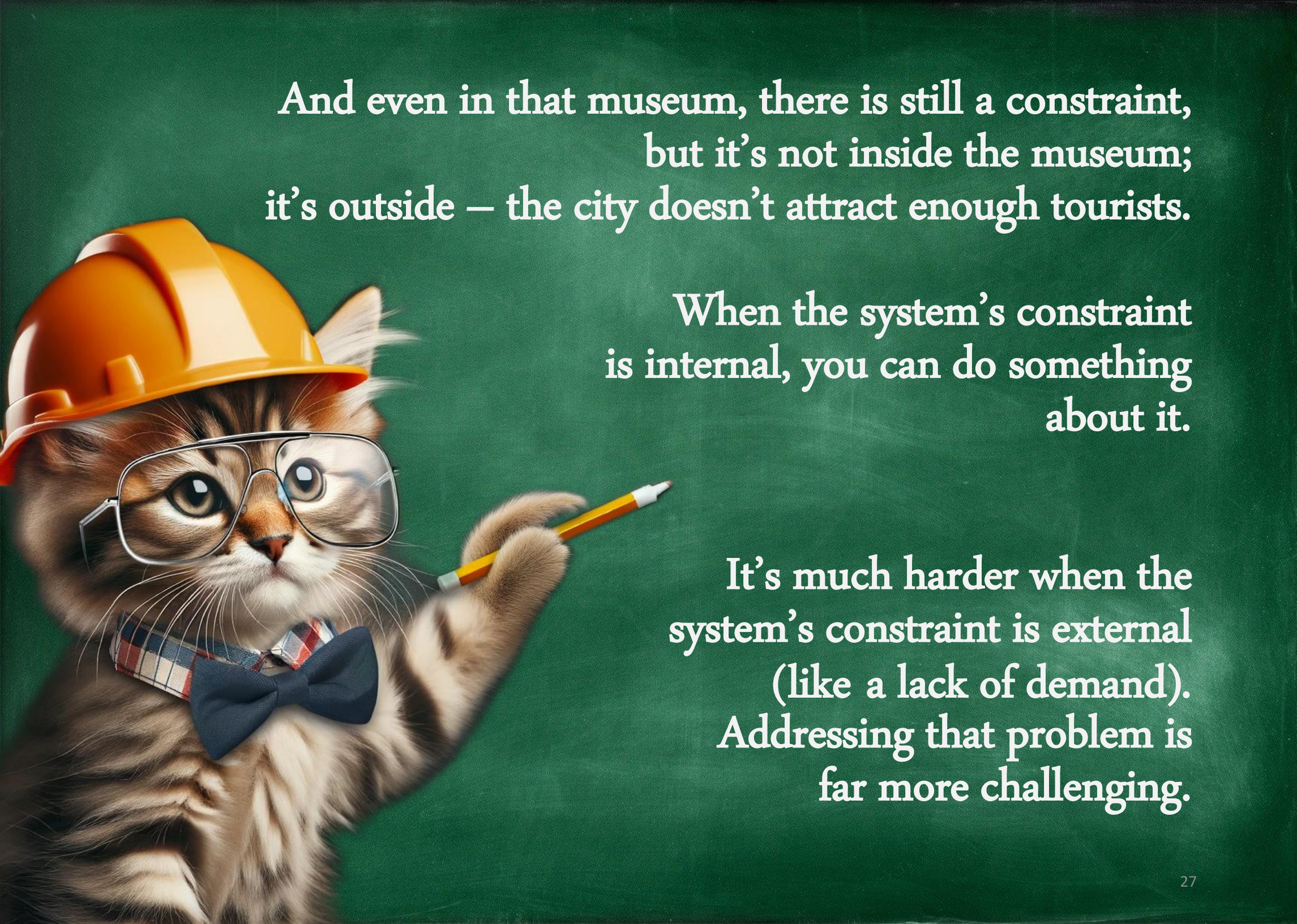
And what about the cloakroom?

Don’t get me started on the restroom!


I was at the Louvre recently!
Such a dream, but oh, the crowds in front of every masterpiece!

Got pics?

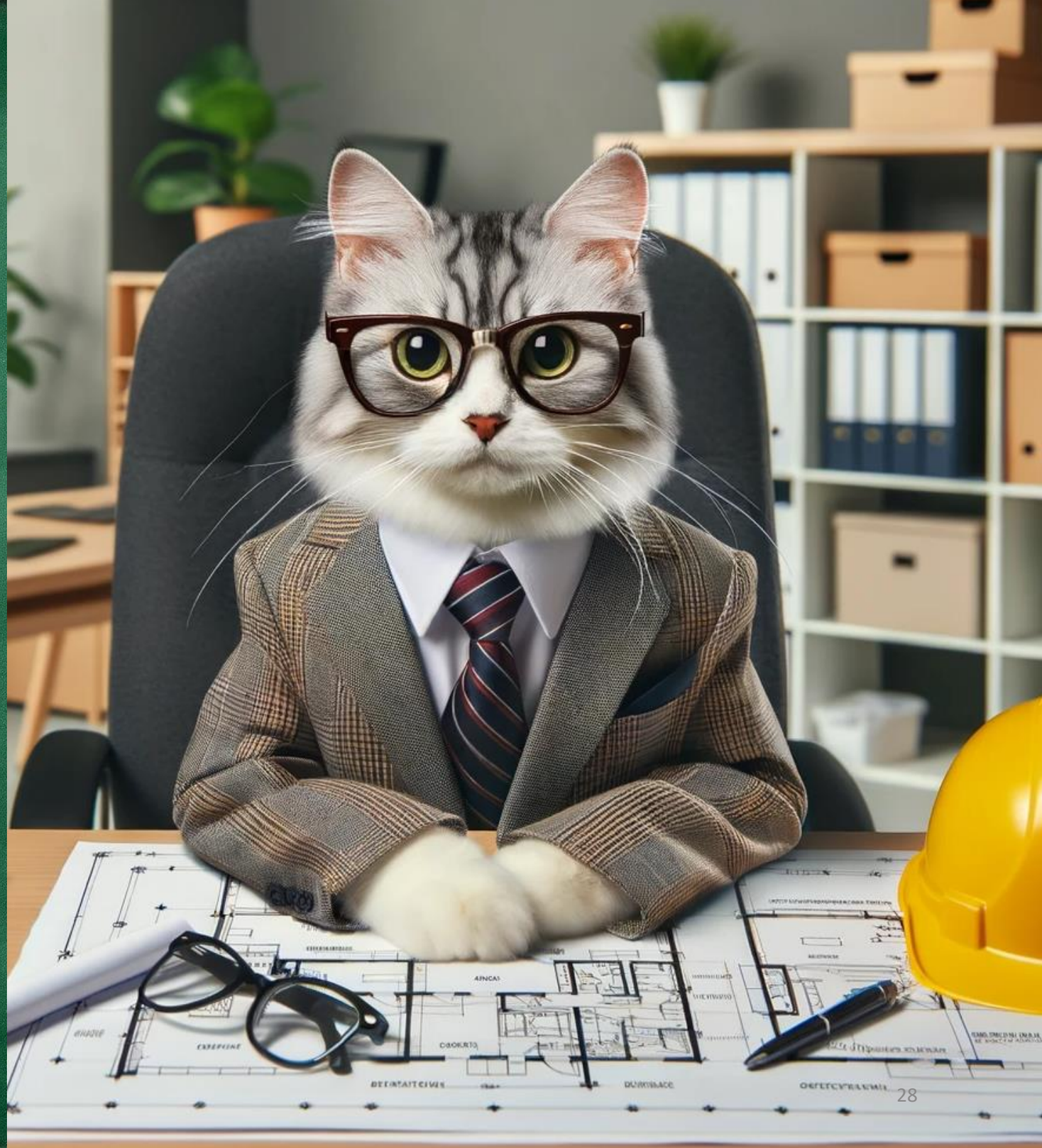
Cheers to no queues in the coffee shop!


And even in that museum, there is still a constraint,
but it's not inside the museum;
it's outside – the city doesn't attract enough tourists.
When the system's constraint
is internal, you can do something
about it.
It's much harder when the
system's constraint is external
(like a lack of demand).
Addressing that problem is
far more challenging.

This is certainly not our situation.

We can be 100% sure that our constraints are internal to our organisation.

In fact, there's a line of customers out the door clamoring for our services!



So, there must be a constraint somewhere within our organisation?

Any idea where it could be?

It’s plain as day — the constraint is in our Architecture Department!

Darlings, it's in the Finances, as if there were any doubt.

Partners aren’t replying to my emails;

it’s definitely them!

Having to travel so far to work three times a week really limits me!


We keep having incidents, and it seems they're constraining us.

…they’re all over the place!

Could it be that there are, in fact, many of them?

Dealing with too many tasks at once is like herding cats; it's a real constraint!


Could it be that they move?


But why move
when sitting still
is so peaceful?

Glance at the map! Mornings are jam-packed here, and evenings are chock-full there! They truly shuffle around!

Oh no...

I hope they don't suspect it's me, do they?

To put it succinctly, we're struggling to pinpoint the bottleneck.

If we don't know where our constraints are, how can we expect to boost productivity by two, three, or even five times?

Clearly, we have a problem!

This is quite a mess here!

Okay, so if we don't know exactly where the bottleneck is, surely it's got to be somewhere, right? What if we relocated it somewhere that works better for us?


And in which enchanted storybook do we find this convenient location?

Suppose, the bottleneck is in the Architecture team.

We're not sure, but let’s just say it is for now.

If that's actually the best place for it, then why change anything?

We might as well keep things as they
are and continue living as we have been.

Is this really living?

Feels more like we're stuck running in circles.

Is there even a reliable way to identify the optimal spot for a bottleneck?

I cannot tell you where it should be, but I definitely know where it should not be —

anywhere it's hardest for us to control, for instance, with our partners.

The reflection doesn't lie: it's either in the Building or the Architecture Team. There's no middle ground.


So, what's our next move?
Do we leave it to chance and flip a coin?

We won’t be leaving anything to chance — time for some calculations!

Picture this: 100 builders on one side, and, on the other, merely two architects with the bottleneck snug in the Architecture, just as we suspected.

Just two architects? That's a drop in the ocean, nowhere near enough!

Calm down, it's a hypothetical!

Essentially, it means that the efficiency of a hundred-plus-person organisation hinges on two people.

Don’t forget I’m on holiday starting Monday, so go ahead and halve everything right now.

As the bottleneck doesn't lie with the Building team, we're left with a surplus of engineering resources that are, for the time being, dormant.

How are we supposed to explain this idle capacity to the big boss?

He’s definitely not going to take kindly to such losses.

Also, spare a thought for the Architecture team duo.

The entire company’s fortunes resting on their shoulders is a recipe for stress and potential burnout.

Furthermore, it's worth mentioning that this kind of pressure often leads to kicking off projects that are half-baked on the architecture side.

The odds of issues popping up are sky-high, putting even more on the plates of our already overburdened architecture team.

Looks like the clock’s hit five

– I’m off to my cosy corner.

I happen to have two tickets for 'Carmen' tonight.

I was wondering, maybe... would you like to join me?

Mind easing up a little?
This cobblestone road is quite a shaker!

[Whispering softly]

Such lovely music!

It's splendid that we're here!

Je vais danser en votre honneur…La fleur que tu m’avais jetée…Non! Tu ne m’aimes pas!

What's your view, in real life, would Carmen have opted for a cosy home life with Jose or freedom?

A character like Carmen, she'd always go for freedom, wouldn't she?

Something's just clicked... what is it?

I've had a vision!
I've figured it out!

The bottleneck should be at our most costly resource! In our case, it's the Building department, simply because we have many builders there.

Hold on!

Won’t shifting the bottleneck toward us just add more work?

We’re already swamped with tasks.

Look, you have a large team, so the workload will be distributed evenly.

Besides, we can think of methods to prevent overloading.

And what methods might those be?

In programming, there's a principle called 'yesterday's weather'.

It helps the team avoid excessive optimism when planning.

It means that you plan tomorrow’s tasks based on what you managed to accomplish today, almost like predicting the weather by looking at today’s clouds.

But just designating a bottleneck won’t make the tasks flow there by themselves!

That’s correct.

To shift the bottleneck, the entire organisation needs to mobilise its efforts.

Efforts?

May I clarify exactly what efforts will be needed?

We need to form a queue of tasks right in front of this resource. The queue indicates that there’s a bottleneck. Where there's a queue, there's a bottleneck.

I always have a pile of things to do, such as a manicure, haircut, all the stuff. But that doesn’t make me a bottleneck, does it?

No, your ’busyness’ doesn’t make you a bottleneck in the work process.

It’s about tasks that affect the process of the whole team, not just your schedule.

Our company has a strict list of priorities.

Doesn’t that form a queue?

Having a list of priorities is just the first step.

These tasks must be ready to be worked on at the bottleneck.

Each task in the list must be ready for immediate start, without the need to wait for approvals or clarifications.

Even in the evening?


Even at night!

Let’s call this buffer of ready-to-start tasks’ a ’healthy backlog’.

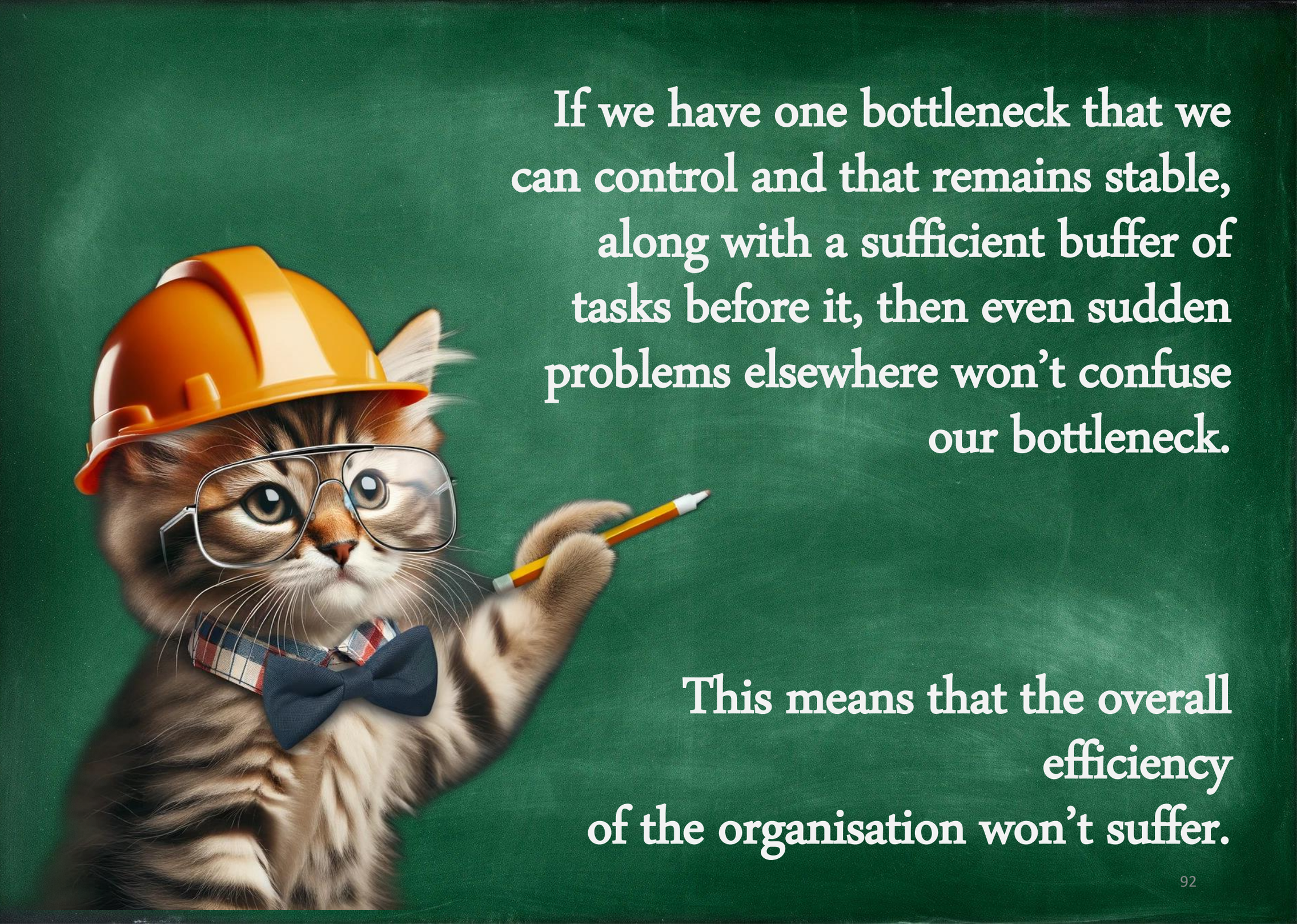
But doesn't that mean that now all problems will be concentrated at the bottleneck?

Not necessarily. Delays can happen at any part of the process, just as before. However, having a buffer of tasks in front of the bottleneck ensures its constant occupation and maintains high productivity.

Previously, when we did not know where the bottleneck was or if it was moving, we reacted to problems spontaneously. Such bottlenecks affected the overall productivity.

Hold on,
please,

I'll write this
down!


If we have one bottleneck that we can control and that remains stable, along with a sufficient buffer of tasks before it, then even sudden problems elsewhere won't confuse our bottleneck.
This means that the overall efficiency of the organisation won't suffer.


But that's the theory; what do I practically need to do every day?

First, always keep an eye out for potential obstacles at the bottleneck. Found one? Eliminate it!

Second, make sure that the bottleneck has enough work in the queue. If there are too few tasks or they've run out - it's time to act!

The remaining time can be used for strategic planning.


Really?
Planning ahead at last?

That's why using our most valuable resource has to be as efficient as possible. It sets the pace for the entire organisation.

Having a task reserve will protect us from any unexpected failures in other areas.

Without a sufficient backlog of tasks at the bottleneck, the process can come to a halt, leading to chaos as problems proliferate throughout the company like mice in a warehouse.

Again!

And who came up with all of this?

Such a management system is called the Theory of Constraints (TOC).
It was first described in 1984 by Eliyahu M. Goldratt.

Let's look at the system using a metallurgical plant as an example.

In such a plant, there is an installation with the highest costs, exceeding the costs of all other installations — a large open-hearth furnace.

This furnace is the primary constraint. The constraint must always be associated with this furnace and should not deviate from it.

The work of all other departments must be oriented towards providing this furnace with the necessary amount of materials.

If this furnace is the primary constraint, and it determines the productivity of the entire enterprise, then the productivity of all other departments must exceed the productivity of this one device.

All departments, except this furnace, have underutilised resources. This is normal, as it ensures the stability of production. The task of the enterprise is to minimise this surplus of resources while maintaining a sufficient reserve in front of the furnace.

There are two ways to lead a factory to disaster:

Method 1: Cost reduction.

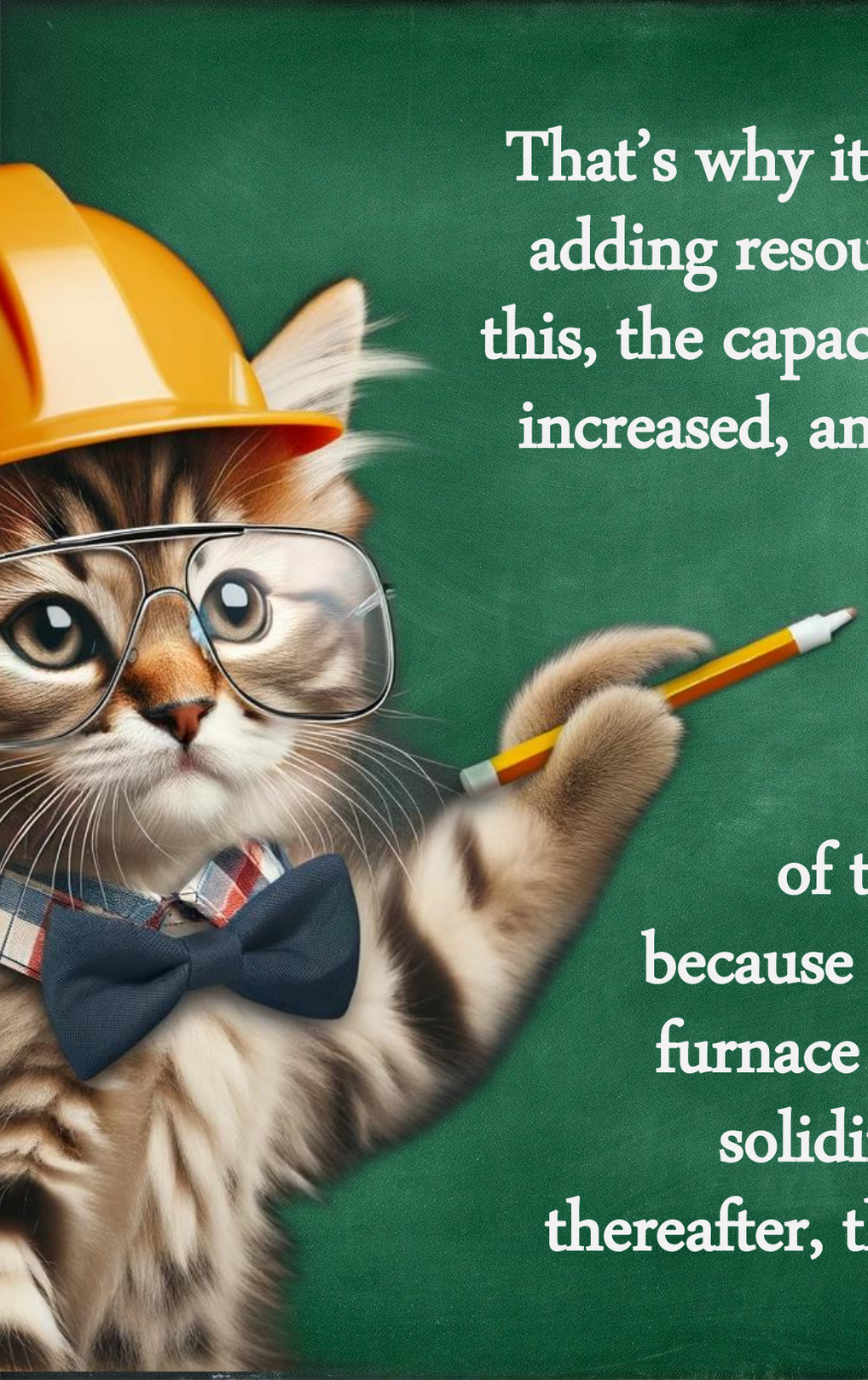
If we reduce unused capacities in all departments to the point where their performance becomes equal to that of the furnace, such 'optimisation' could lead to catastrophic consequences, including a complete halt in production.

Now, any problem in any department will have a direct impact on the operation of the central furnace. If issues arise anywhere (and they inevitably will), the central furnace may simply cease to function.

Method 2:
A significant increase in furnace productivity, for example, by constructing a second furnace next to it.

The simultaneous operation of two furnaces will quickly deplete material reserves.

The bottleneck will start to move throughout the organization, leading to a chaotic workflow. Instead of the expected doubling of productivity, we may face a catastrophic decline.



That's why it is necessary to be cautious when adding resources to bottlenecks. Before doing this, the capacities of other processes should be increased, and only after that should a second furnace be built!

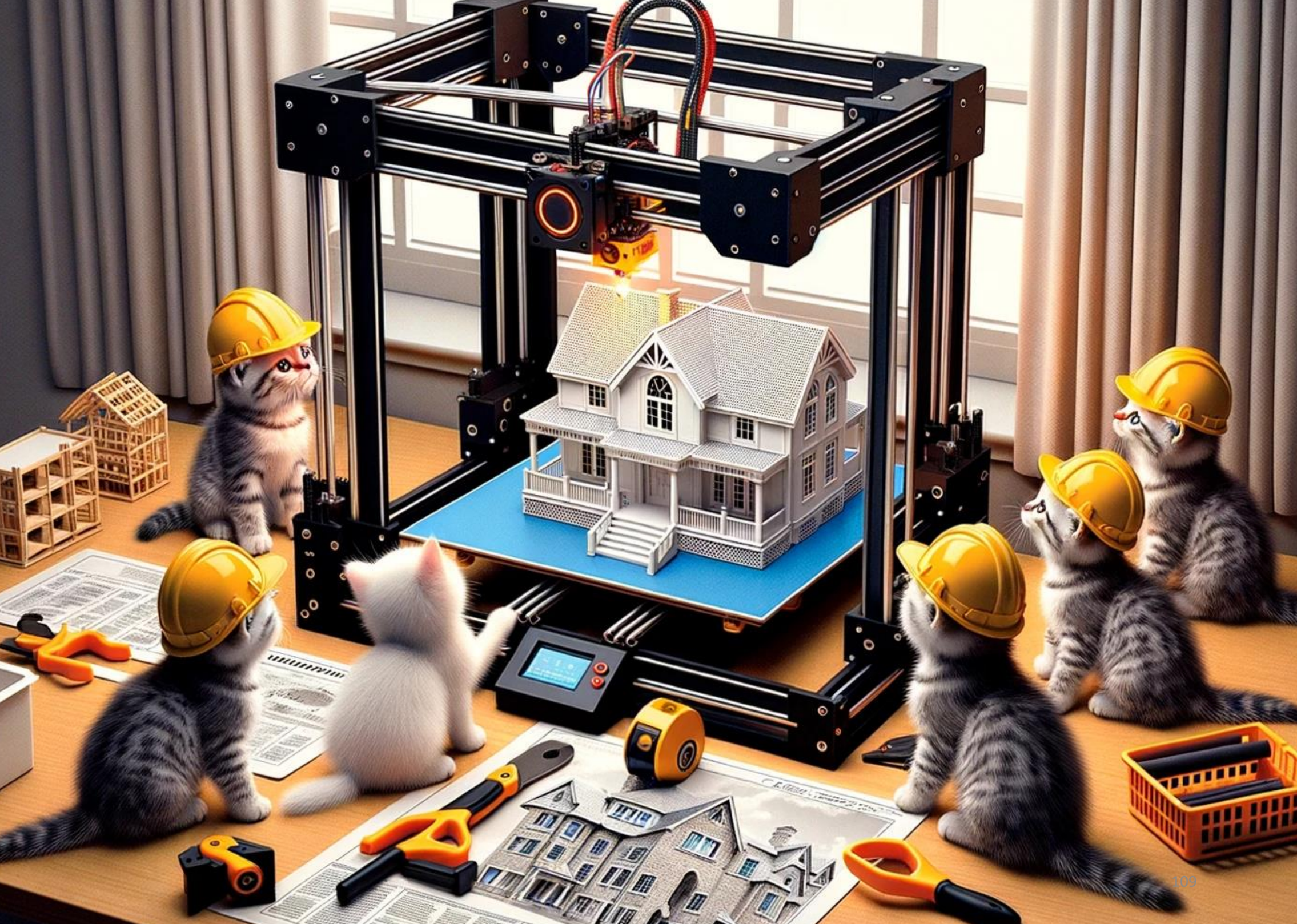
In this particular example, the consequences of depleting the material supplies in front of the furnace would be catastrophic because the shutdown of the open-hearth furnace will lead to its cooling down, the solidification of the metals inside, and, thereafter, the furnace will become unusable.

Stop scaring us already!


Oops, what
did I miss?

Summary:

1. In any organisation, there is always at least one constraint, usually called a bottleneck. In the worst case, there may be several bottlenecks, which, moreover, move around.
2. Ideally, there would be one stable bottleneck located on the costliest resource of the organisation.
3. The role of the organisation is to maintain a sufficient buffer of priority tasks that are critical to the business for this resource, ready for immediate execution.
4. The task of the bottleneck is to work continuously and with maximum efficiency.



THE
END

Kitties Engineers: Theory of Constraints

„Why on earth aren't we scaling up to double, triple, or heavens above, quintuple our output?“

„I've got this niggling feeling that there's always a constraint in any system... if not, it would zoom off at light speed.“

Alexey Blyakhin

Embark on a unique journey into the world of organizational efficiency with Alexey Blyakhin's "Kitties Engineers: Theory of Constraints". This innovative book offers a fresh, engaging perspective on Eliyahu Goldratt's renowned Theory of Constraints (TOC), brought to life through charming AI-generated art and captivating comics.

Why This Book is a Must-Read:

Engaging Storytelling: Discover the complexities of TOC through a series of enthralling comics featuring adorable kitties, making complex principles more accessible and enjoyable.
Unique Visual Experience: Delight in the distinctive AI-generated illustrations that add a layer of visual engagement to the educational content.
Humor Meets Wisdom: A perfect blend of light-hearted humor and deep insights ensures an enjoyable read for both professionals and enthusiasts.

What You'll Discover:

Practical Tools: Learn to identify and manage bottlenecks in any organization, enhancing efficiency and productivity. **Everyday Examples**: Complex concepts are broken down using relatable scenarios, simplifying understanding and application.

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