

AI and developer obsolescence: is this the beginning of the end?

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Seb Rose

Co-author of The BDD Books
(Discovery & Formulation) - available ...



Agenda

Disclaimers

Is there a problem?

How did we get here?

What has abstraction got to do with it?

Where did the complexity go?

Can AI and ML replace software developers?

Does AI present other new challenges?

Where does that leave us?

Disclaimers

- I'm not an AI expert
- I've been very wrong before
- This talk was originally about low code/no code solutions

Agenda

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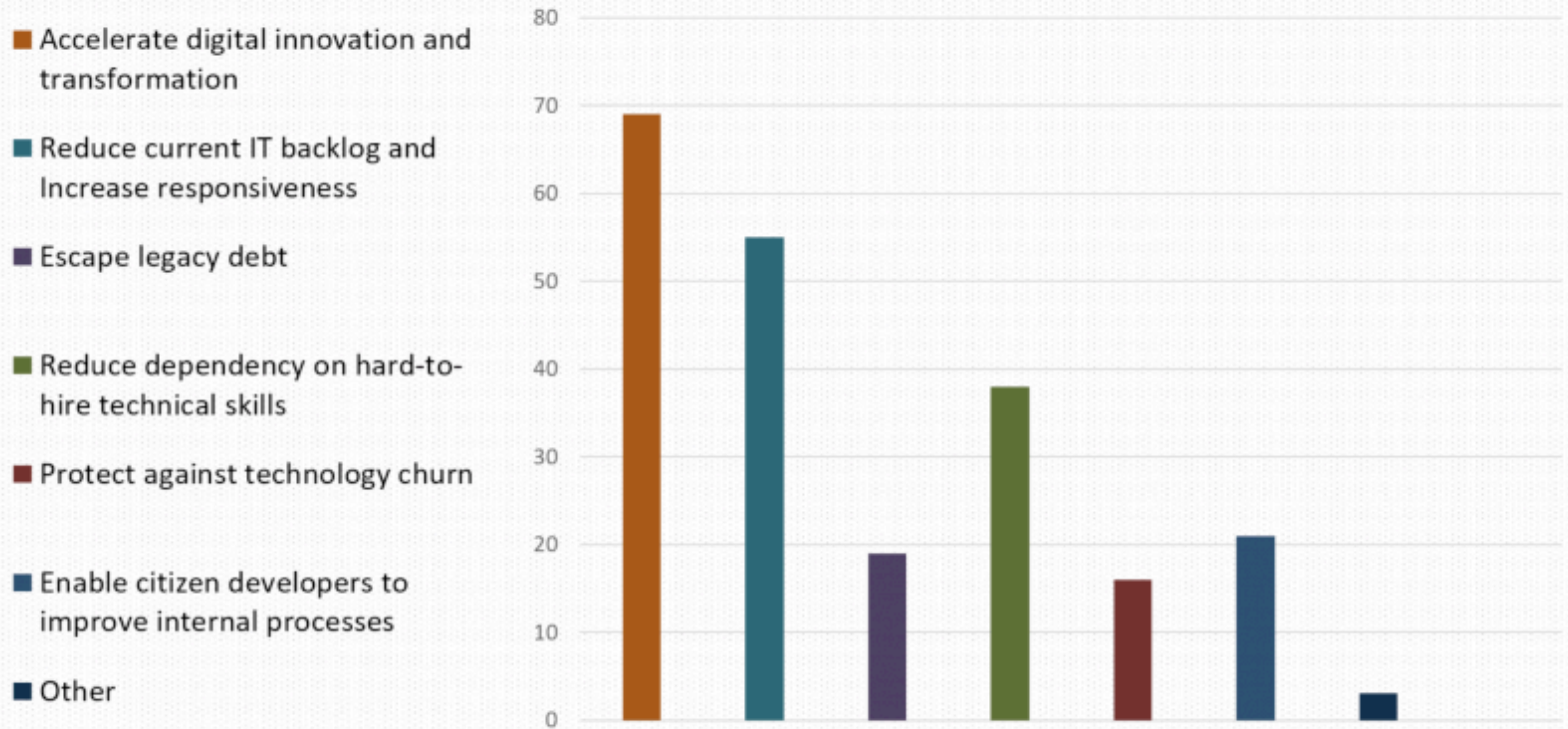
Where did the complexity go?

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Reasons For Using Low-Code Platforms



Ref: OutSystem | *The State of Application Development | How IT is responding to Digital Disruption and Innovation – 2018*

Three common complaints

Misalignment of business & IT -
put the business in control

Time-to-market & speed -
increase productivity

Shortage of skilled people -
reduce the need for software developers

Three common complaints

Misalignment of business &

put the business in control

BETTER

Time-to-market & speed

increase productivity

FASTER

Shortage of skilled people

reduce the need for software developers

CHEAPER

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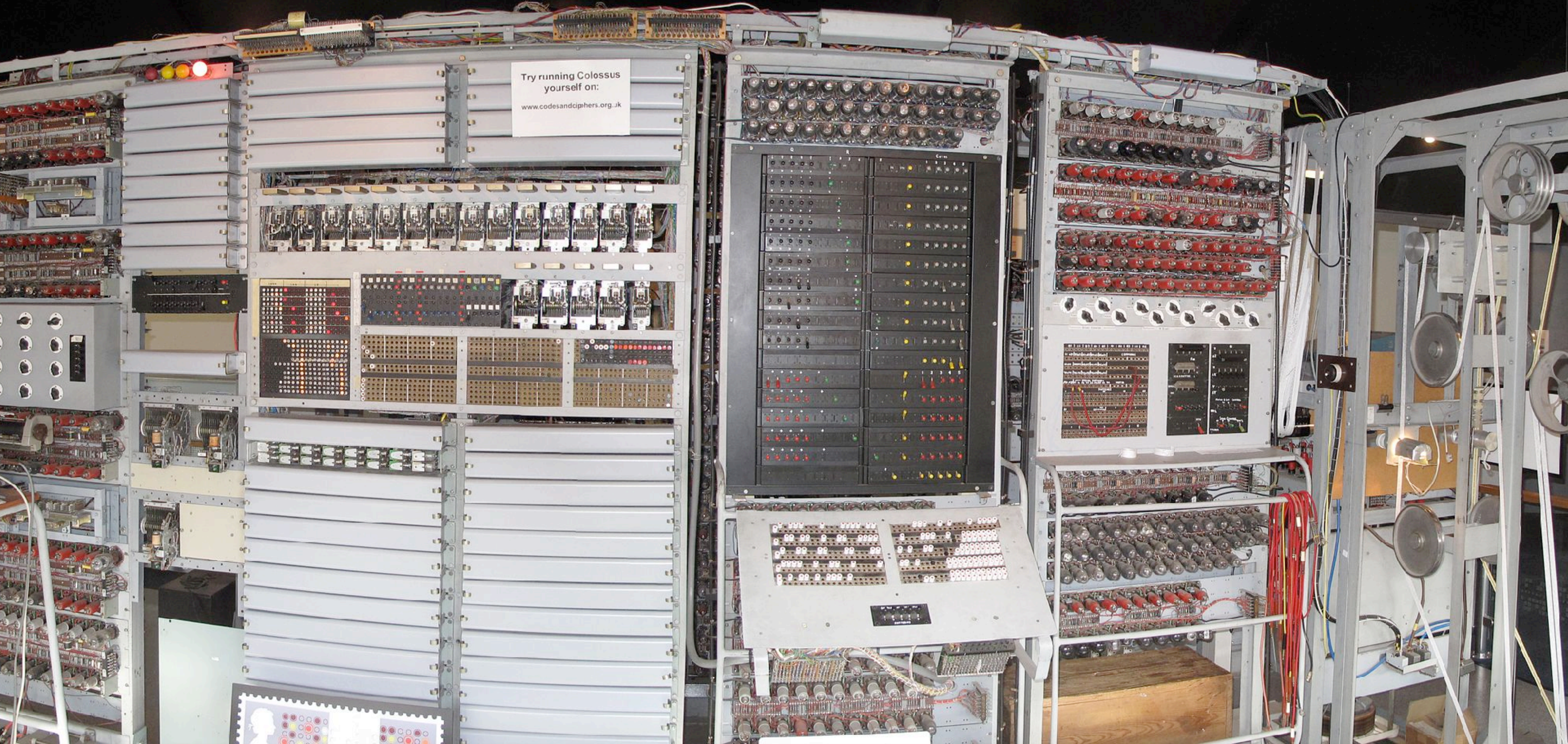
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Hardware



TedColes, CC BY-SA 4.0 <<https://creativecommons.org/licenses/by-sa/4.0/>>, via Wikimedia Commons

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Machine code to assembler

```
100
101
102
103
104
105
106
107 00000030 B9FFFFFFF
108
109
110 00000035 41
111 00000036 803C0800
112
113
114 0000003A 75F9
115
116
117
118
119
120
121
122 0000003C C3
```

```
-----
; zstr_count:
; Counts a zero-terminated ASCII string to determine its size
; in:  eax = start address of the zero terminated string
; out: ecx = count = the length of the string

zstr_count:                ; Entry point
    mov  ecx, -1           ; Init the loop counter, pre-decrement
                           ; to compensate for the increment

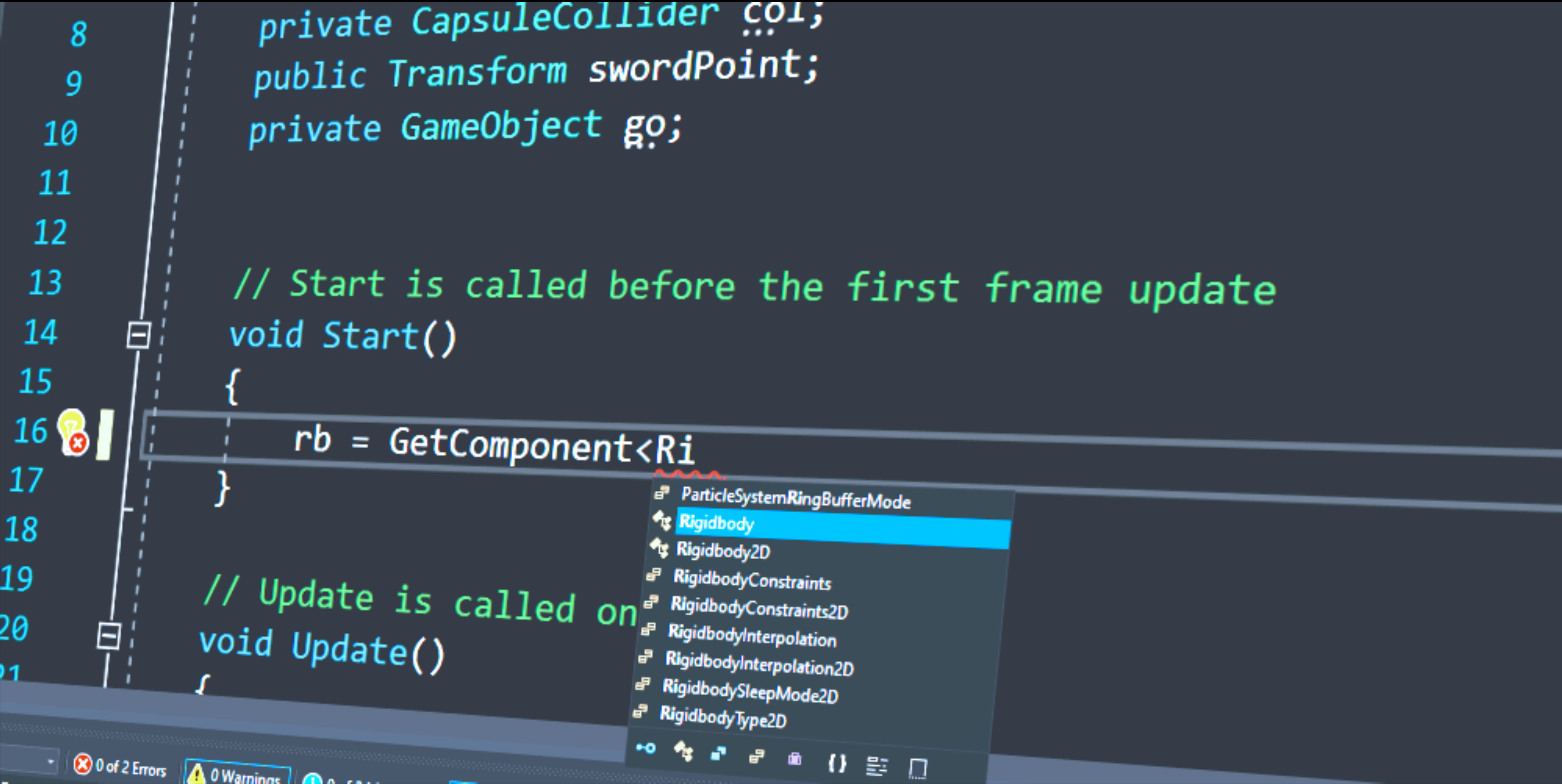
.loop:
    inc  ecx               ; Add 1 to the loop counter
    cmp  byte [eax + ecx], 0 ; Compare the value at the string's
                           ; [starting memory address Plus the
                           ; loop offset], to zero
    jne  .loop            ; If the memory value is not zero,
                           ; then jump to the label called '.loop',
                           ; otherwise continue to the next line

.done:
                           ; We don't do a final increment,
                           ; because even though the count is base 1,
                           ; we do not include the zero terminator in the
                           ; string's length
    ret                   ; Return to the calling program
```

<https://www.differencebetween.com/difference-between-machine-language-and-vs-assembly-language/>

IDE magic - VSCode

```
8 private CapsuleCollider col;  
9 public Transform swordPoint;  
10 private GameObject go;  
11  
12  
13 // Start is called before the first frame update  
14 void Start()  
15 {  
16     rb = GetComponent<Ri  
17 }  
18  
19 // Update is called on  
20 void Update()  
21 {
```

A screenshot of the Visual Studio Code editor showing a C# script. The code includes fields for a capsule collider, transform, and game object, followed by Start and Update methods. A lightbulb icon indicates an IntelliSense suggestion. A dropdown menu is open, listing various Unity classes, with 'Rigidbody' selected. The status bar at the bottom shows '0 of 2 Errors' and '0 Warnings'.

- ParticleSystemRingBufferMode
- Rigidbody**
- Rigidbody2D
- RigidbodyConstraints
- RigidbodyConstraints2D
- RigidbodyInterpolation
- RigidbodyInterpolation2D
- RigidbodySleepMode2D
- RigidbodyType2D

<https://blog.terresquall.com/2020/11/fixing-visual-studios-intellisense-autocomplete-in-unity/>

AI generated code - Copilot

The screenshot displays the Visual Studio Code interface with the Copilot sidebar on the left and a code editor on the right. The sidebar contains a chat window with the following text:

Write code in JavaScript to make sure that submitted value for phone number field is in valid format

Copilot

You may add the following code to your JavaScript file.

```
function validatePhoneNumber(phoneNumber) {
  const regex = /^\(?\([0-9]{3}\)\)?[-. ]?([0-9]{3})[-
```

The code editor shows the generated code in a file named `Copilot-Contact-Us-ebed.basicform.custom_javascript.js`. The code is as follows:

```
1 function validatePhoneNumber(phoneNumber) {
2   const regex = /^\(?\([0-9]{3}\)\)?[-. ]?([0-9]{3})[-
3   return regex.test(phoneNumber);
4 }
5
```

A red arrow points from the Copilot chat window to the code editor, indicating the source of the generated code. The status bar at the bottom shows the current cursor position: `Ln 5, Col 1`, along with other settings like `Spaces: 4`, `UTF-8`, `CRLF`, and `JavaScript`.

Low code - OutSystems

The screenshot displays the OutSystems development environment for a project named 'eBidding'. The main workspace shows a flowchart for the 'Save' action within the 'Request_Bid_PopupEditor' screen. The flowchart starts with a 'SetRequest' activity, followed by a 'Valid?' decision diamond. If 'Valid?' is 'False', the flow goes to a 'BidEdit' activity, then an 'Input_FocusFirst Invalid' activity, and finally an 'End' activity. If 'Valid?' is 'True', the flow goes to a 'CreateOrUpdateBid' activity, then a 'BidId = NullIdentifier()' decision diamond. If 'BidId = NullIdentifier()' is 'True', the flow goes to a 'RegisterSupplier Activity' activity, which is highlighted with a tooltip. If 'BidId = NullIdentifier()' is 'False', the flow goes to a 'Feedback_Message' activity, then a 'Popup_Editor_Notify' activity, and finally an 'End' activity. There is also an 'ExceptionFeedback Message' activity leading to an 'End' activity.

Action
RegisterSupplierActivity (Suppliers eSpace)

Arguments
SupplierId (Supplier Identifier): Value not set
Description (Text): Value not set

RegisterSupplierActivity must have 1 outgoing connector in 'Save' Screen Action.
A valid expression must be set for parameter 'SupplierId'.
A valid expression must be set for parameter 'Description'.

Flowchart Details:

- Start: SetRequest
- Decision: Valid?
 - False: BidEdit → Input_FocusFirst Invalid → End
 - True: CreateOrUpdateBid
- Decision: BidId = NullIdentifier()
 - True: RegisterSupplier Activity
 - False: Feedback_Message → Popup_Editor_Notify → End
- Exception: ExceptionFeedback Message → End

https://youtu.be/b_TK4YMSXIU

No code - WordPress



No code - WordPress

WordPress Engineer
5 Years Experience
Fix Any kinds Of
WordPress **Errors/Bugs**




Before Order please contact with me



How to Resolve Recurring WordPress Problems?



Fix WordPress Issues



Order Now

By **UiXpider**

Fix WP Errors
Fix WP Bugs

6 Most Common WordPress Problems and their Solutions



TemplateToaster
Let's Build Web Designing

FIX WORDPRESS ISSUE OR BUG



We'll Fix it

24 HOURS EXPRESS DELIVERY

FIX YOUR BROKEN WEBSITE TUTORIAL

2018



WPCrafter
WordPress Reviews & Tutorials For Non-Techies

Agenda

Disclaimers

Is there a problem?

How did we get here?

What has abstraction got to do with it?

Where did the complexity go?

Can AI and ML replace software developers?

Does AI present other new challenges?

Where does that leave us?

Abstraction

the process of removing physical, spatial, or temporal details or attributes in the study of objects or systems to focus attention on details of greater importance;

it is similar in nature to the process of generalisation

Abstraction hides complexity

Accidental complexity ...

can be simplified by a new idea, design, technique, procedure, or approach

Essential complexity ...

can't be simplified OR loses value when it is simplified

Abstraction

Abstraction
is
EVIL!

*Jim Coplien ("Cope")
ACCU 2000*

In most object oriented design, most abstraction is evil. It is an excuse to ignore things we don't want to deal with even though we should.

<https://www.artima.com/forums/flat.jsp?forum=106&thread=6771>

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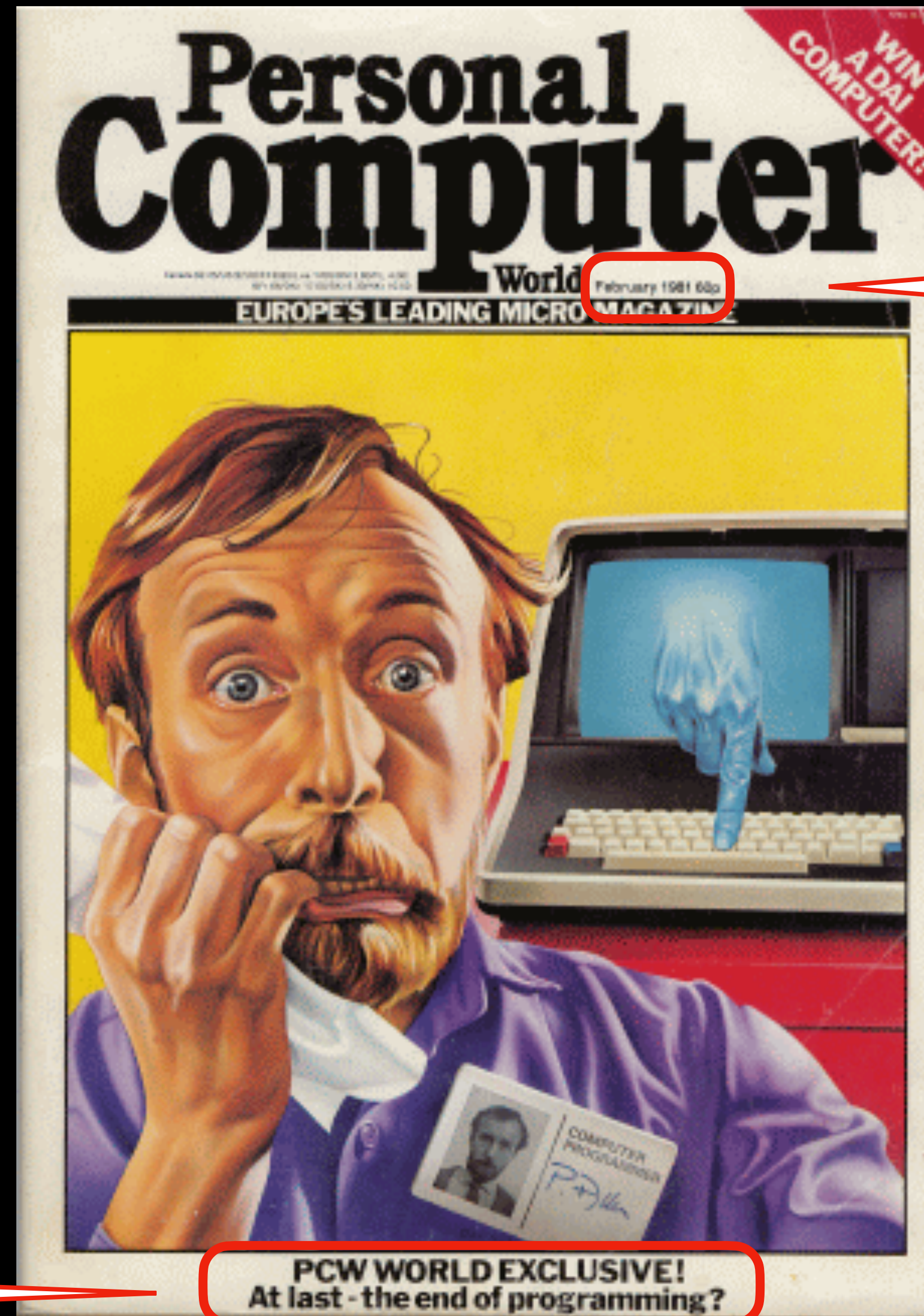
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The Last One (TLO)

February
1981



“At last - the
end of
programming?”

Configuration

Copy this shortcode and paste it into your post, page, or text widget content:

```
[contact-form-7 id="1630" title="support form"]
```

- Form
- Mail
- Messages
- Additional Settings
- Conditional fields**

Conditional fields

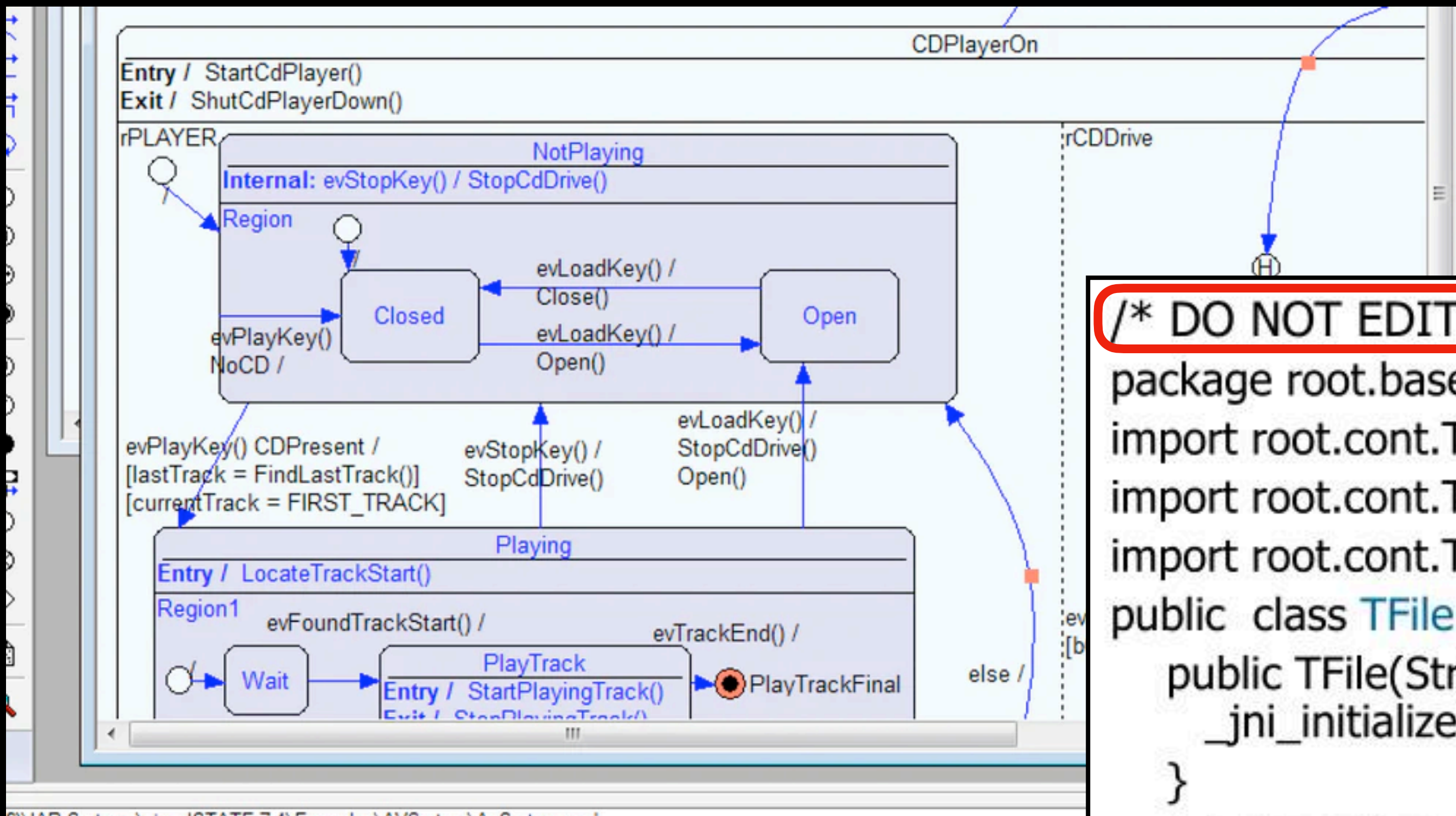
Show	technical-support ▼	if	support-type ▼	equals ▼	Technical support	And	remove
Show	sales-support-selected ▼	if	support-type ▼	equals ▼	Sales	And	remove
Show	os-selected ▼	if	operating-system ▼	not equals ▼	-- Choose your operating system --	And	remove
Show	os-android ▼	if	operating-system ▼	equals ▼	Android	And	remove
Show	os-ios ▼	if	operating-system ▼	equals ▼	iOS	And	remove
Show	os-linux ▼	if	operating-system ▼	equals ▼	Linux	And	remove
Show	os-windows ▼	if	operating-system ▼	equals ▼	Windows	And	remove
Show	os-other-selected ▼	if	operating-system ▼	equals ▼	Other	And	remove

[click to add new conditional rule](#)

[import/export](#)

```
show [technical-support-selected] if [support-type] equals "Technical support"  
show [sales-support-selected] if [support-type] equals "Sales"
```

Troubleshooting



/* DO NOT EDIT THIS FILE - it is machine generated */

```
package root.base;
import root.cont.TArrayC;
import root.cont.TObjArray;
import root.cont.TList;
public class TFile extends TDirectory implements Cloneable {
    public TFile(String fname, String option, String ftitle, int compress) {
        _jni_initialize(fname, option, ftitle, compress);
    }
    private native void _jni_initialize(String fname, String option,
        String ftitle, int compress);
    ...
    public native void Draw(String option);
    public void Draw() { Draw(""); }
    ...
}
```

Consultancy

[TLO] not only worked (eventually) but, for donkey's years, its publisher made money out of a consulting business wrapped around the software.

Three common complaints revisited

Misalignment of business & IT -
put the business in control

Time-to-market & speed -
increase productivity

Shortage of skilled people -
reduce the need for software developers

Three common complaints revisited

Misalignment of business & IT -
still a need for IT domain expertise

Time-to-market & speed -
delays for customisation & troubleshooting

Shortage of skilled people -
lack of even more specialised consultants

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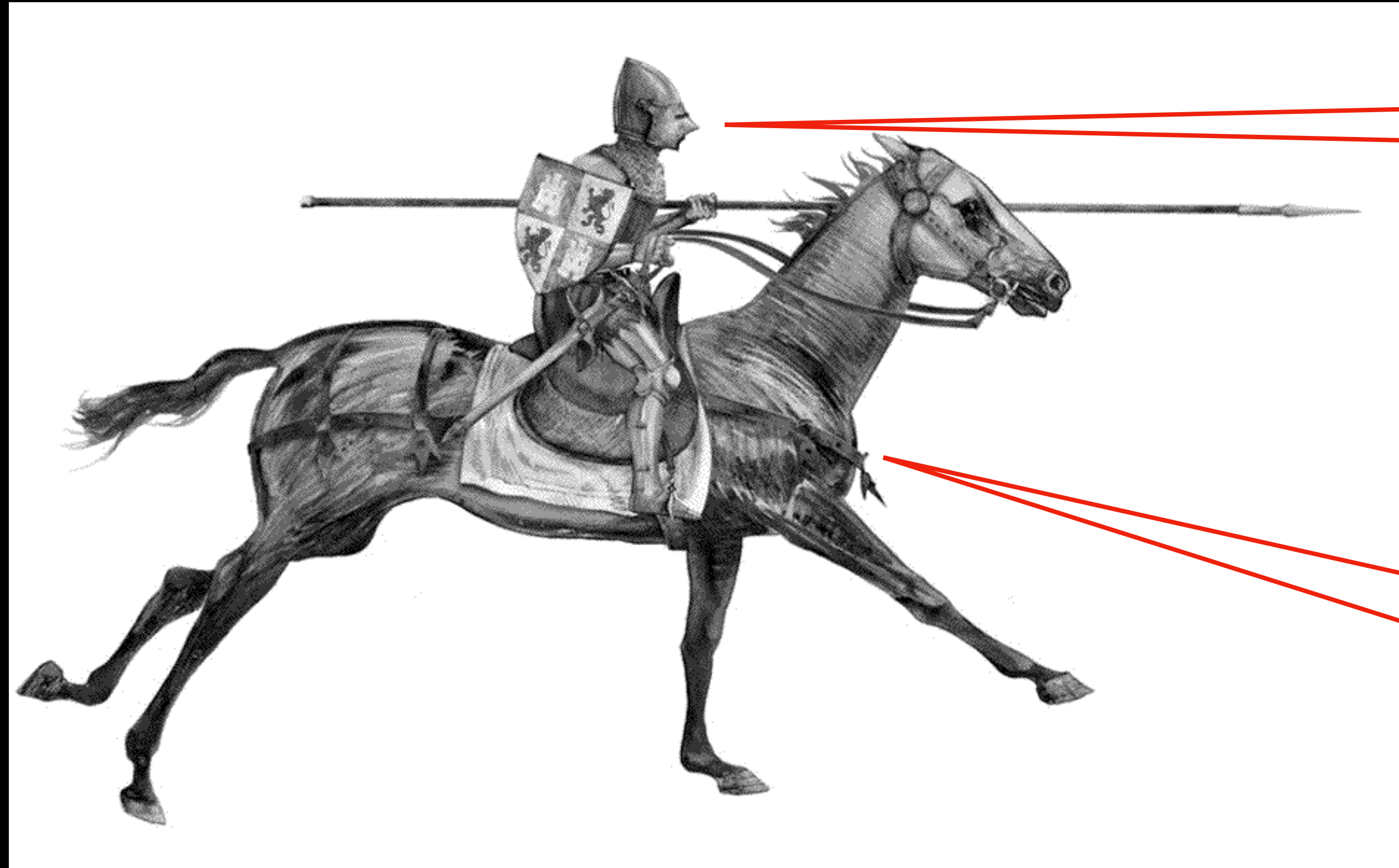
Can AI and ML replace software developers?

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Can AI and ML help?

**Artificial
Intelligence**



**Machine
Learning**

Artificial general intelligence

Artificial **general intelligence** (AGI) is the *hypothetical* ability of an intelligent agent to understand or learn any intellectual task that a human being can.

It is a primary goal of some artificial intelligence research and a common topic in science fiction and futures studies.

Strong and weak AI

AGI can also be referred to as strong AI, full AI, or general intelligent action.

In contrast to strong AI, weak AI or "narrow AI" is not intended to have general cognitive abilities; rather, weak AI is any program that is designed to solve exactly one problem.

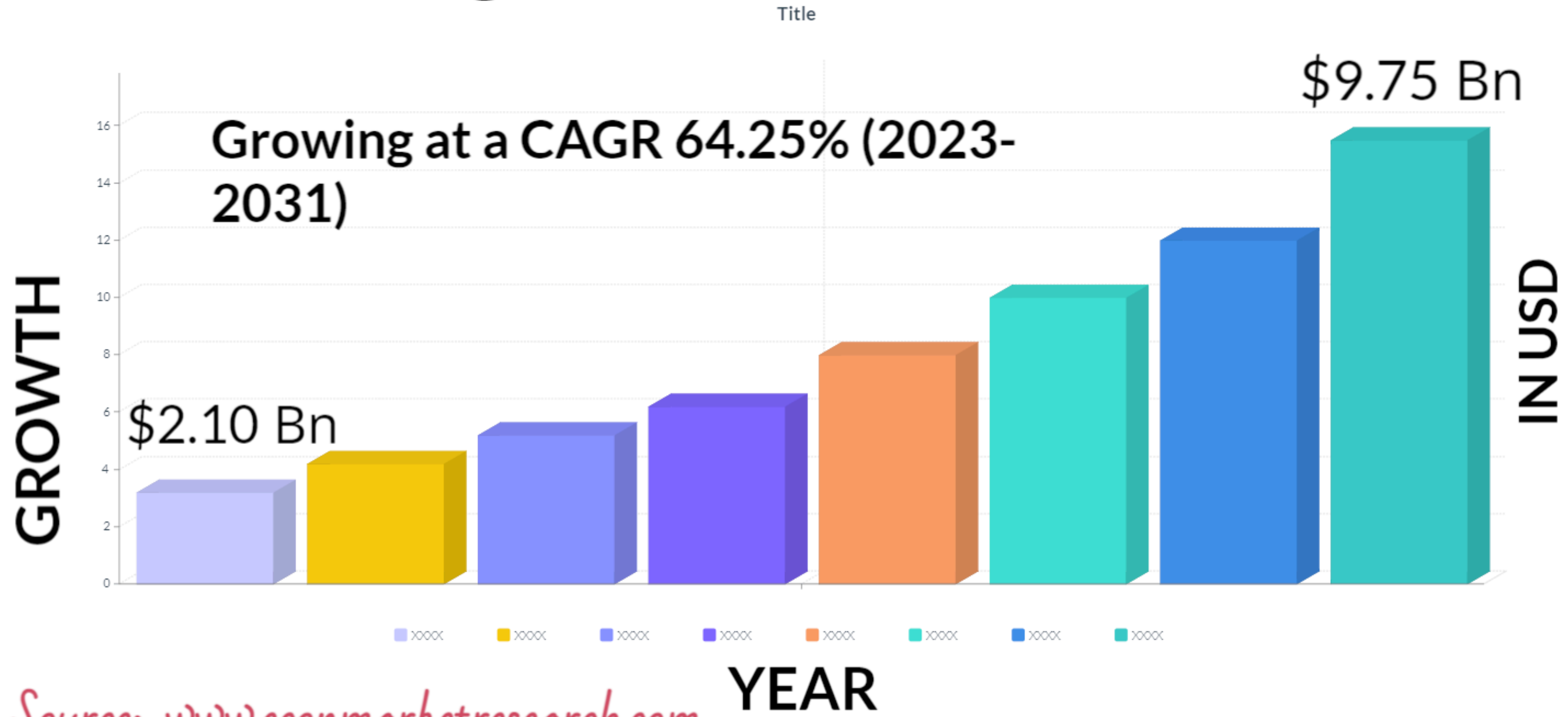
Large language models

A large language model (LLM) is a type of **machine learning** model designed for natural language processing tasks such as language generation.

The largest and most capable LLMs are **generative pretrained transformers** (GPTs).

LLMs (and ML) are data greedy

AI Training Dataset Market



Source: www.econmarketresearch.com

LLMs (and ML) are resource hungry

“The lifecycle of an AI system from birth to death has many fractal supply chains: forms of exploitation of human labor and natural resources and massive concentrations of corporate and geopolitical power.

And all along the chain, a continual, large-scale consumption of energy keeps the cycle going”

Microsoft's Kate Crawford: 'AI is neither artificial nor intelligent'



KATE CRAWFORD



ATLAS OF AI

<https://www.theguardian.com/technology/2021/jun/06/microsofts-kate-crawford-ai-is-neither-artificial-nor-intelligent>

Limited capacity to innovate ...

Comment | Published: 20 November 2023

LLMs differ from human cognition because they are not embodied

[Anthony Chemero](#) 

[Nature Human Behaviour](#) 7, 1828–1829 (2023) | [Cite this article](#)

Large language models (LLMs) are impressive technological creations but they cannot replace all scientific theories of cognition. A science of cognition must focus on humans as embodied, social animals who are embedded in material, cultural and technological contexts.

... but unpredictable hallucinations



Leslie Brooks, CSPO, CSM · 1st

Specification by Example/BDD Trainer and Coach, Process Transfor...

[Visit my website](#)

1d · 🌐

#LLMs and **#BDD** - The good, the bad, and the hallucinations

I have been experimenting with Mistral, and now with Llama3, and they show promise, but are clearly not there yet. Llama3 is clearly better than Mistral 7B, but still makes absolute beginner mistakes when prompted with "Please complete this scenario for searching a library catalog: 'Scenario: The catalog can be searched by the author's name'". I counted five mistakes in a four-line scenario.

Most relevant ▼



Matt Wynne (He/Him) · 1st

Lead Software Gardener

1d (edited) ...

Naming no names, but I have been quoted in at least one article, obviously written by an LLM on mushrooms, attributing quotes to me that I have never said. In fact attributing the same quote to me and then to Aslak in the same article! I'm sure neither of us has ever said it.

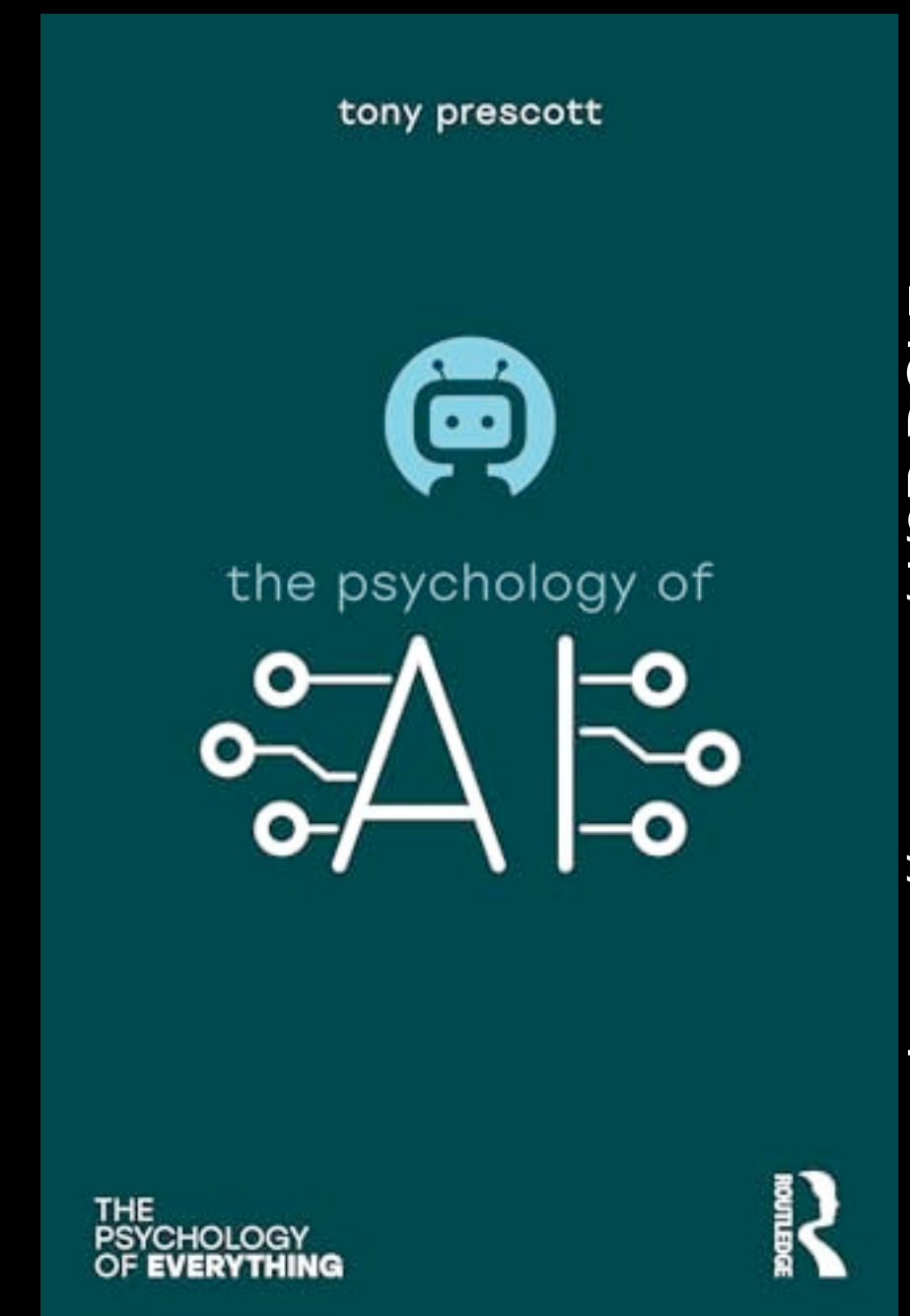
...see more

Like | Reply · 1 Reply

... and predictable limitations

“More broadly, a wide range of computational processes ... have their own internal logic, which cannot be accurately captured by a learning machine such as a transformer network.

ChatGPT is not solving maths and engineering challenges from first principles, so you would not want to use it to pilot a plane or build a bridge”



<https://amzn.eu/d/9PtDck7>

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Bias



SAMPLE BIAS

When a dataset does not reflect the realities of the environment in which a model will run.



MEASUREMENT BIAS

When a method of collecting and testing a model doesn't accurately reflect the real world.



PREJUDICE BIAS

When an AI model unintentionally shows stereotypical prejudice due to limited or incomplete training.

Explainability

THE FIVE PILLARS OF EXPLAINABLE ARTIFICIAL INTELLIGENCE



EXPLANATION

Explainable AI as they help uncover the hidden meaning behind an algorithm's decision and helps open the black box of ML models



ACCURACY

The ability of that explanation to allow different groups and individuals to understand the explanations generated by the system



RELEVANCE

The explanations generated by an XAI system are only meaningful if they fulfil the purpose of making the stakeholder understand the system's decision



BOUNDARIES

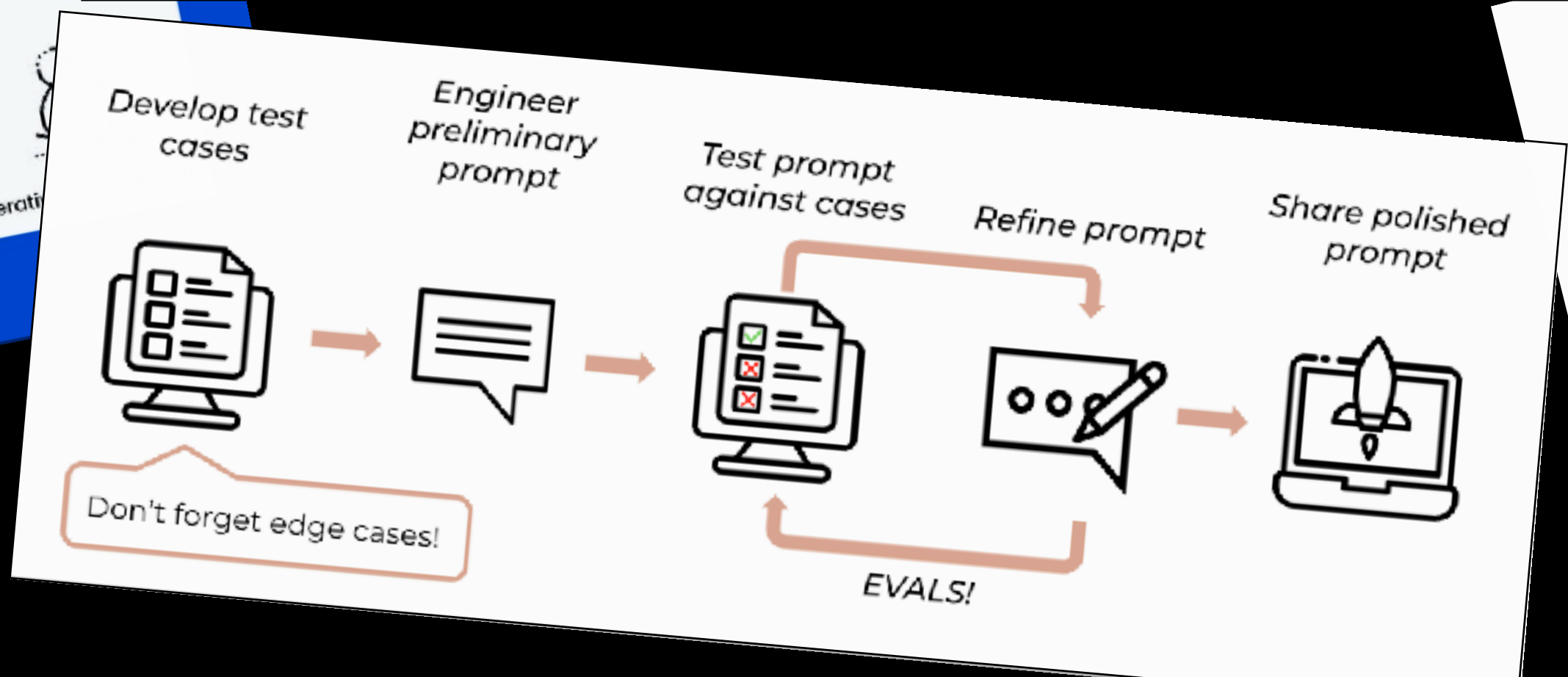
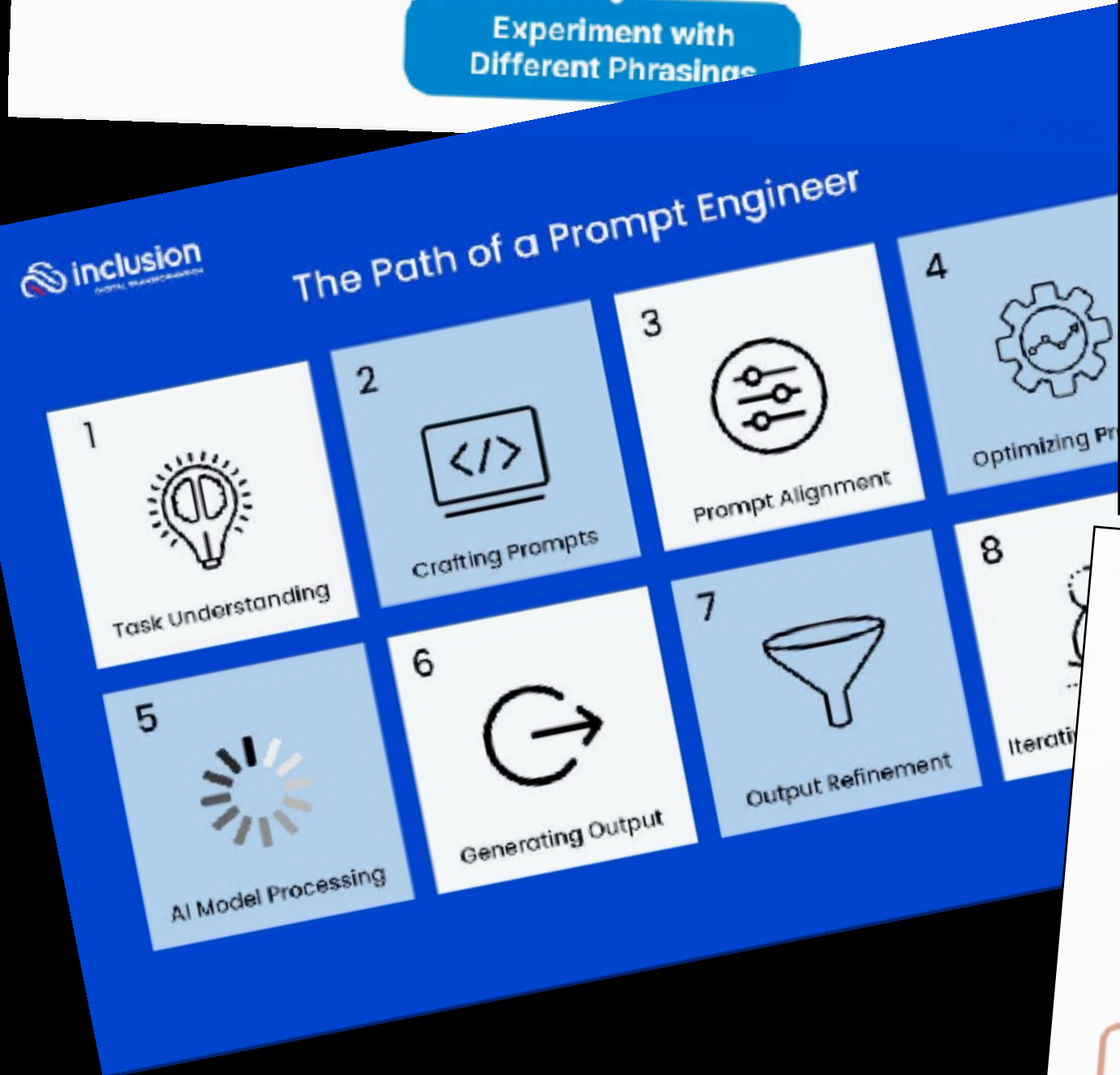
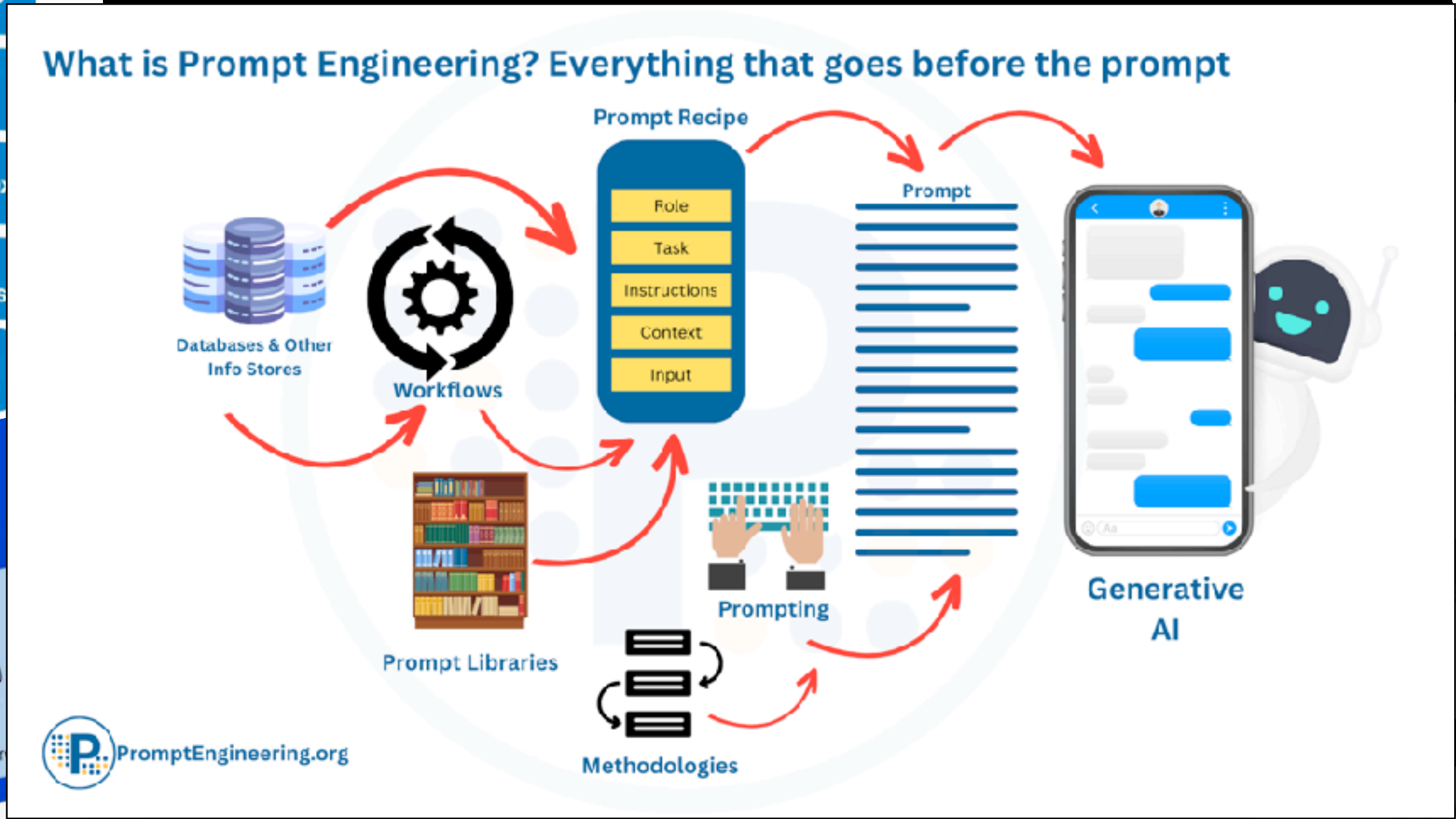
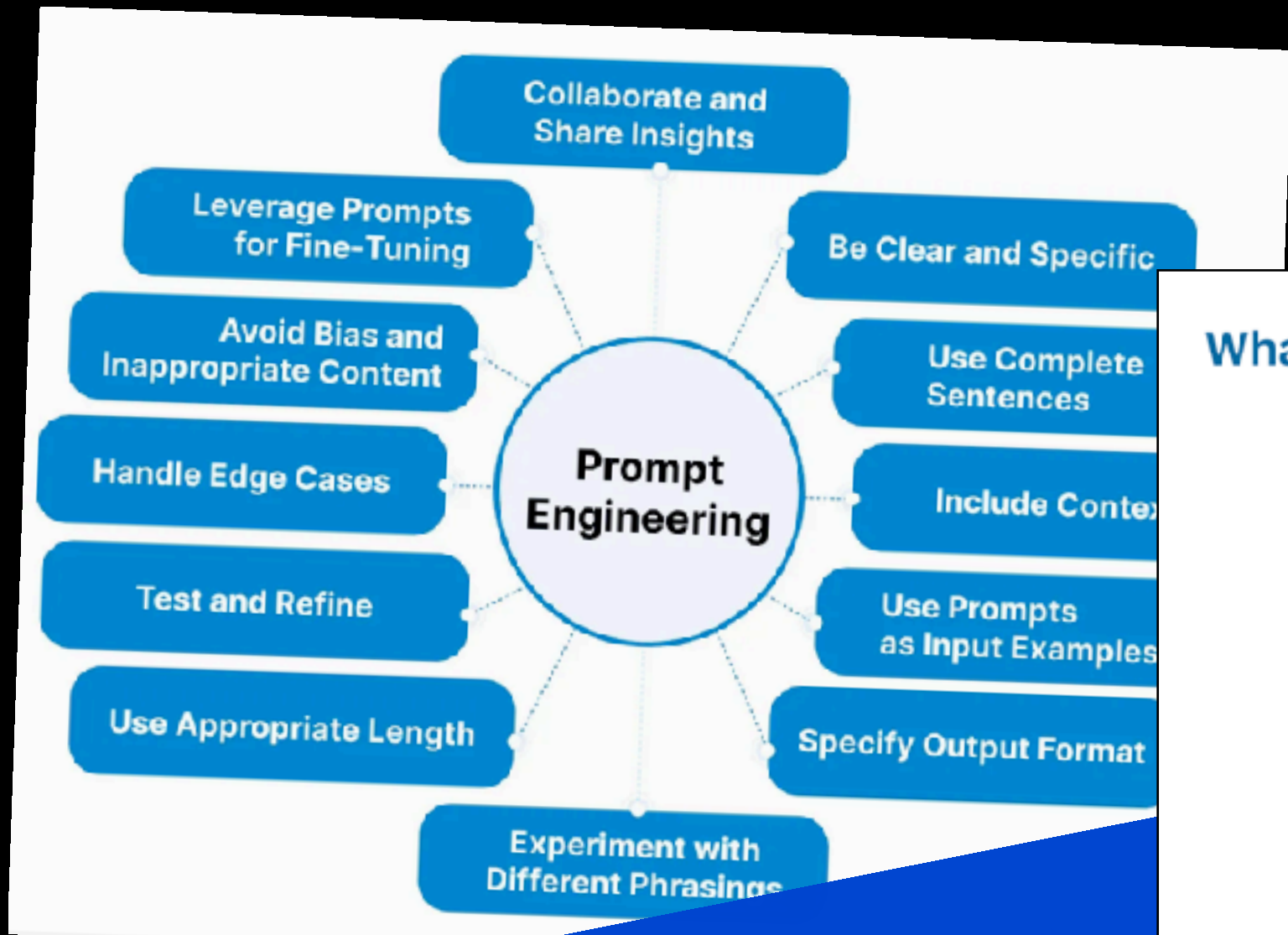
An XAI system should always know its boundaries and should not try to give out explanations if it doesn't have any



FEEDBACK

Feedback is always an important part of any system as it keeps the system in check and helps in systematic improvement

Prompt engineering



Master Prompt Engineering
www.PromptEngineering.org

A vertical flowchart showing the progression from "Intro To AI" to "Prompt Engineering - Overview" to "Prompting - Overview". Below this are three numbered cards:

- 1 Large Language Models
- 2 Text2Image Models
- 3 Emerging Models - Test-2-Speech, Text-2-Audio, Speech-2-Text

12 Prompt Engineering Techniques

A collection of techniques including:

- Least-To-Most
- Self-Ask
- Meta-Prompt
- Chain-Of-Thought
- ReAct
- Symbolic Reasoning
- PAL
- Iterative Prompting
- Sequential Prompting
- Self-Consistency
- Automatic Reasoning and Tool-use
- Generated Knowledge

Requirements management



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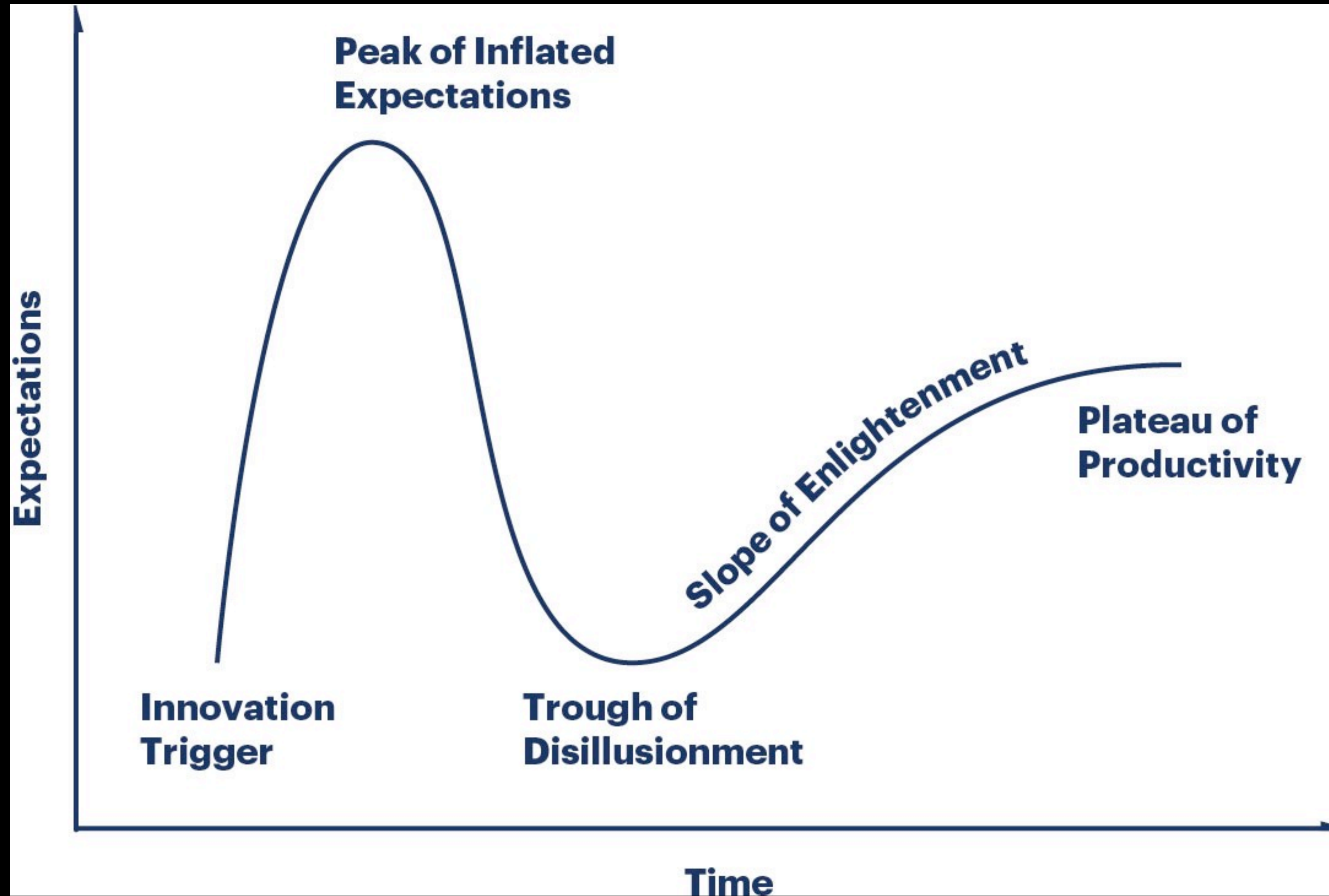
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The hype cycle



Fred Brooks
1933 - 2022



There's still no silver
bullet

AI and ML - tools not solutions



<https://www.pngall.com/robot-png>

<https://webstockreview.net/explore/gingerbread-clipart-cookie-cutter/>

@sebrose@mastod

sep@claysnow.co.uk

Three existing approaches

Misalignment of business & IT -

collaboration

Time-to-market & speed -

continuous delivery

Shortage of skilled people -

education and training

Takeaways

**Better, faster,
cheaper for limited
domains only**

**New challenges
incorporating
into working
practices**

**AI and ML are tools not
solutions**

**Essential
complexity
cannot be
simplified**

Is this the beginning of the end?

**Software developers will be
in demand for the
foreseeable future**

QUESTIONS?

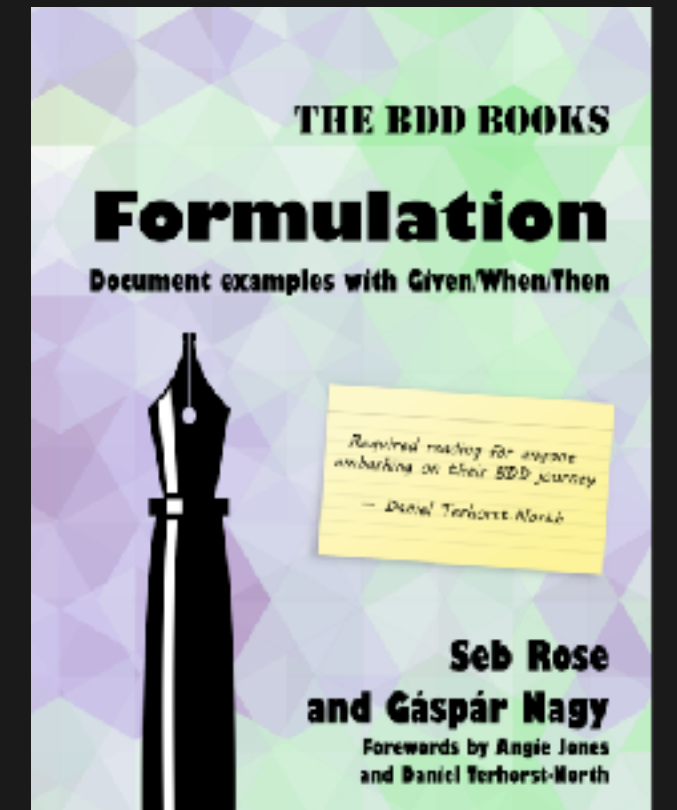
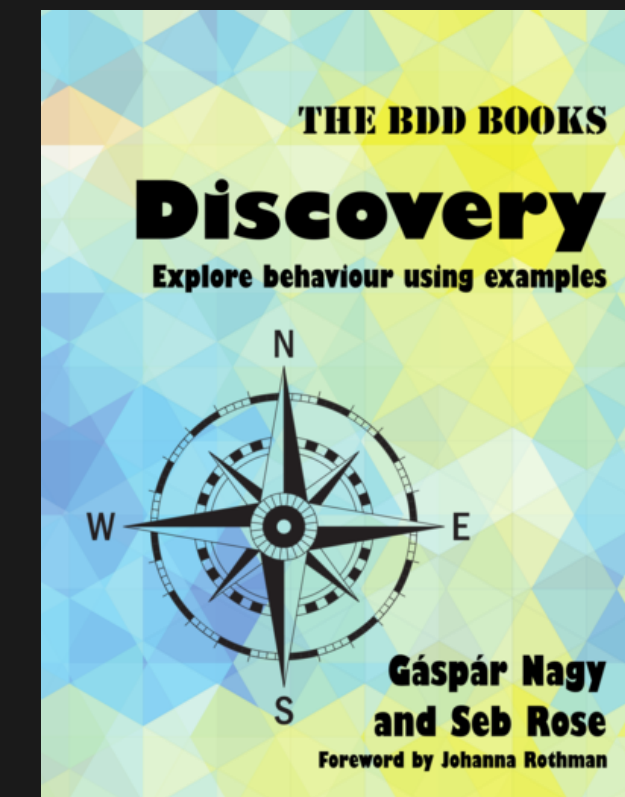
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<https://bddbooks.com>



Seb Rose

Co-author of The BDD Books
(Discovery & Formulation) - available ...

