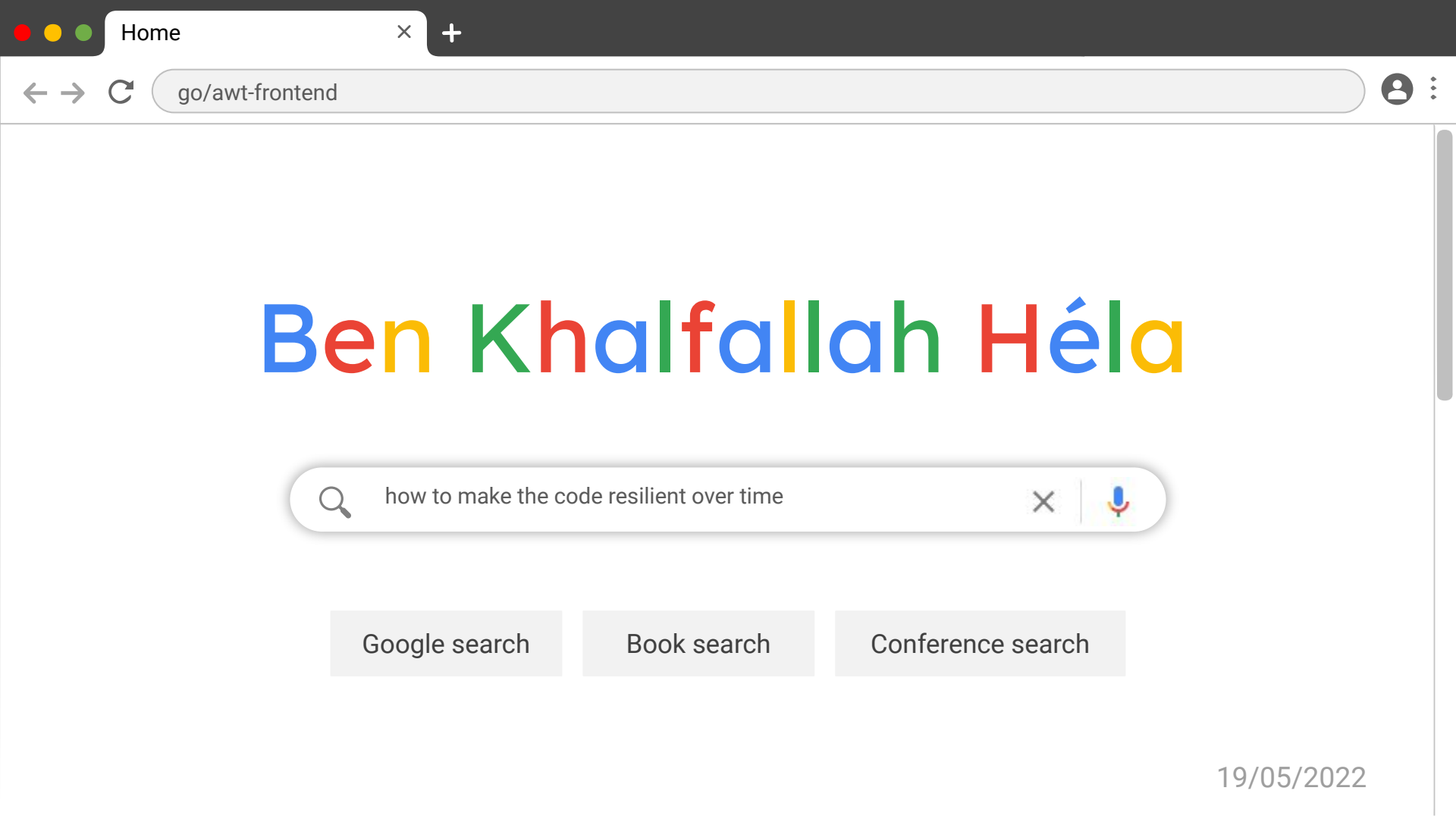
Home
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Ben Khalfallah Héla
how to make the code resilient over time
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19/05/2022

Software Engineering at Google

Today, software engineers need to know not only how to program effectively but also how to develop proper engineering practices to make their codebase sustainable and healthy.

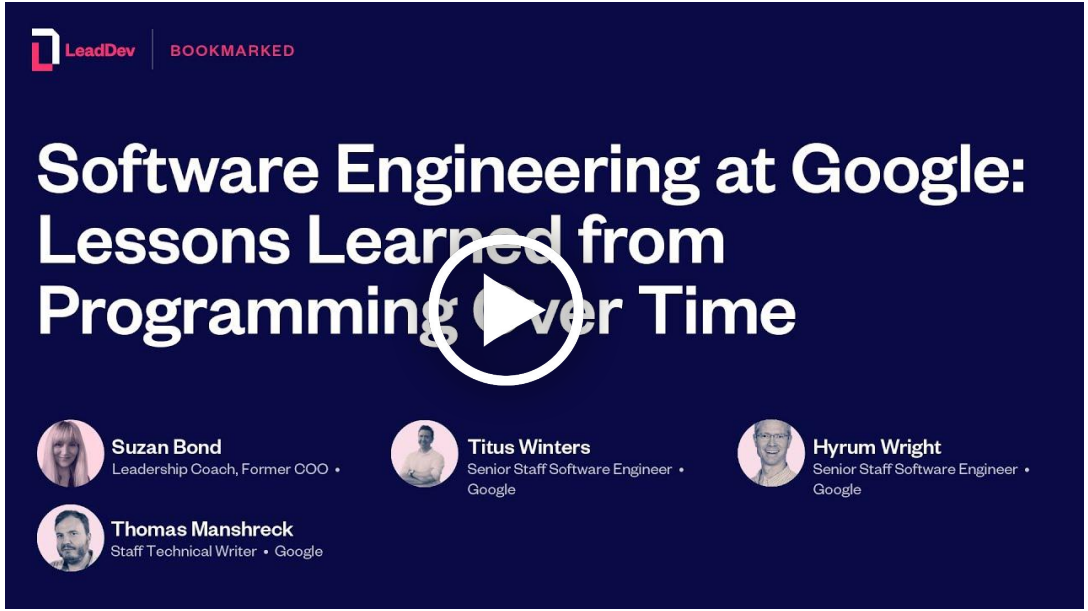
How can software engineers manage a living codebase that evolves and responds to changing requirements and demands over the length of its life? Based on their experience at Google, software engineers, present a candid and insightful look at how some of the world's leading practitioners construct and maintain software.

This book covers Google's unique engineering culture, processes, and tools and how these aspects contribute to the effectiveness of an engineering organization.

Home | Conferences | Software engineer...

https://www.google.com/search?q=software+engineering+at+google

Software Engineering at Google: Lessons Learned from Programming Over Time



https://www.youtube.com/watch?v=z7bQt9MXrwU

Find out how some of the best engineering minds at Google have written, developed, implemented and maintained software on a large scale.

They will be discussing the importance of developing good engineering processes for sustainability and touching on their knowledge of scaling and cultivating an effective culture.

- ❏ Understand how Google's engineering culture and processes contribute to an effective engineering team.
- ❏ Learn fundamental principles for your software organization to apply.
- ❏ Manage the impact of scaling on engineering practices.
- ❏ Maintain a living code base that will stay resilient over time.

Outline

CULTURE

What is software engineering ?

Knowledge sharing

Working well on teams

PROCESSES

Style guide and rules

Code review

Documentation

Testing

Deprecation

TOOLS

Version control and branch management

Build system and philosophy

Critique: Google's code review tool

Static analysis

Dependency management

Continuous integration and delivery

1

CULTURE


Google
What is software engineering ?

“Cubes aren’t squares, distance isn’t velocity. Software engineering isn’t programming.”

Software Engineering at Google

“Within Google, we see three critical differences between programming and software engineering: time, scale, and the trade-offs at play.”

Software Engineering at Google

Time

- Software engineering is programming integrated over time.
- Programming tasks (development) and software engineering tasks (development, modification, maintenance).
- One way to see the impact of time on a program is to think about the question, “What is the expected lifespan of your code?”.
- The short-lived systems are effectively “just” a programming problem, in the same way that a cube compressed far enough in one dimension is a square.
- Your project is sustainable if, for the expected life span of your software, you are capable of reacting to whatever valuable change comes along, for either technical or business reasons.
- When you are fundamentally incapable of reacting to a change in underlying technology or product direction, you’re placing a high-risk bet on the hope that such a change never becomes critical. For short-term projects, that might be a safe bet. Over multiple decades, it probably isn’t.

“For most Google projects, we must assume that they will live indefinitely — we cannot predict when we won’t need to upgrade our dependencies, language versions, and so on.”

Software Engineering at Google

“Over time, we need to be much more aware of the difference between “happens to work” and “is maintainable.””

Software Engineering at Google

“Your organization’s codebase is sustainable when you are able to change all of the things that you ought to change, safely, and can do so for the life of your codebase.”

Software Engineering at Google

Scale

- How many people are involved? What part do they play in the development and maintenance over time?
- A programming task is often an act of individual creation, but a software engineering task is a team effort.
- Human costs are not the only finite resource that needs to scale. Just as software itself needs to scale well with traditional resources such as compute, memory, storage, and bandwidth, the development of that software also needs to scale, both in terms of human time involvement and the compute resources that power your development workflow.
- The codebase itself also needs to scale. If your build system or version control system scales superlinearly over time, perhaps as a result of growth and increasing changelog history, a point might come at which you simply cannot proceed.
- “How long does it take to do a full build?”, “How long does it take to pull a fresh copy of the repository?”, or “How much will it cost to upgrade to a new language version?”
- If costs grow superlinearly over time, the operation clearly is not scalable.

Churn rule

Churn rule

Development branches

Dev branches

Compiler upgrade

Compiler upgrade

Factors that affect flexibility

Factors that affect the flexibility of codebase

Shifting left

Shifting left

Trade-offs

- cc

Distributed builds

Distributed builds

Deciding between time and scale

Deciding between time and scale

Sum up

dddd


Google
How to work well on teams ?

Help me hide my code

Help me hide my code

The genius myth

The genius myth

Hiding considered harmful

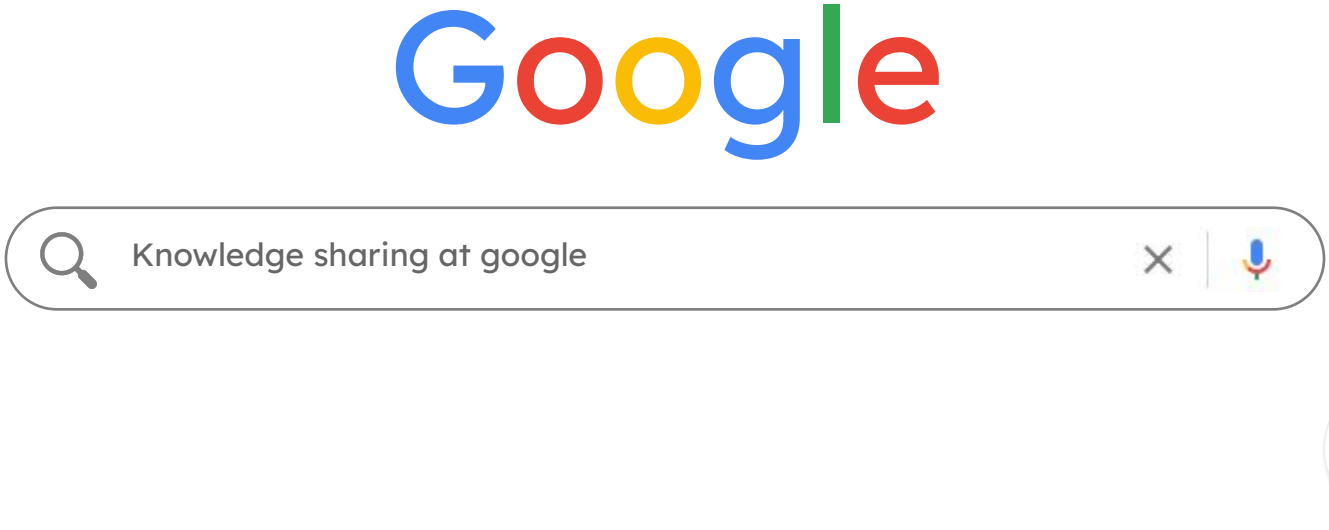
Hiding considered harmful

Failure is an option

Failure is an option

Being Googley

Being googley


Google
Knowledge sharing at google

Ask question

dddd

Understand context

dddd

Scaling your question

dddd

YAQS

dddd

Scaling your knowledge

dddd

Documentation

dddd

Canonical source of informations

Canonical source of informations

Staying in the loop

dddd

2

PROCESSES

Readability process

sssss

Style guide and rules

sssss

Code review

sssss

Documentation

sssss

Testing

sssss

Deprecation

sssss

3

TOOLS

Version control and branch management

sssss

Build system and philosophy

sssss

Critique: Google's code review tool

sssss

Static analysis

sssss

Dependency management

sssss

Continuous integration

sssss

Continuous delivery

sssss

Thank You

hela ben khalfallah

Medium https://helabenkhalfallah.medium.com/

@b_k_hela

Add your title here

One of the keys to an effective presentation is keeping it simple, concentrate on your core message.

Make it easy for your audience to understand and respond.

Aenean massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus.

The home icon is linked to the first slide.

Add your images

Images are a big part of any slideshow presentation. They help your audience connect with your ideas on a more emotional level.

You can split your content

Remember that most of our presentation templates allow you to change the colors by editing the master – this works both in PowerPoint and Google Slides – , so you can adapt them to your needs.

Colors are emotional and evoke feelings. The right colors can help persuade and motivate, they can increase your audience's interest and improve learning comprehension and retention.

Add your title here

Did you know that pandas don’t hibernate?

When winter approaches, they head lower down their mountain homes to warmer temperatures, where they continue to chomp away on bamboo!

Did you know that a cat uses its whiskers as feelers to determine if a space is too small to squeeze through?

Also, cats love to sleep. A fifteen-year-old cat has probably spent ten years of its life sleeping.

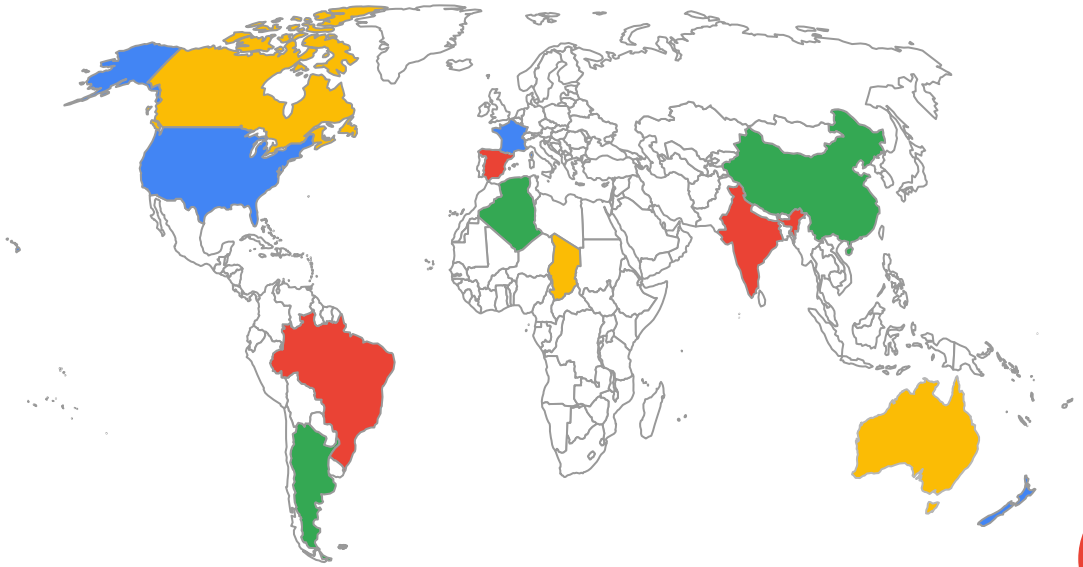
Did you know that elephants can sense storms?

Elephants may be able to detect a thunderstorm from hundreds of miles away, and will head towards it, looking for water.

Add your map here

You can use maps to show your offices or markets. Or as charts, highlighting the countries and adding your data.

Double click on the desired country and change fill color.



Use charts for a more visual way to compare data.

Title A

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Title B

Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

Title C

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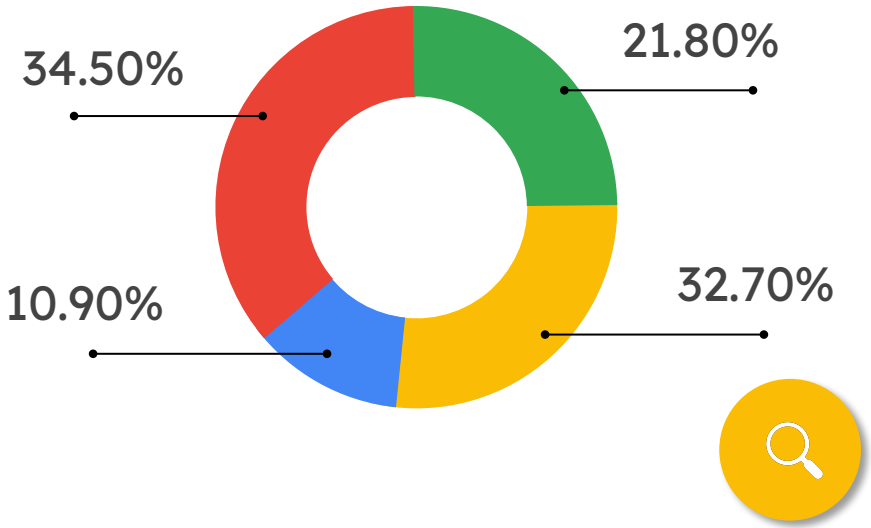
Title D

Lorem ipsum dolor sit amet, consectetuer adipiscing elit.



Add your title here

TITLE A	TITLE B	TITLE C
Something	Something	Something
Something again	Something again	Something again
Another dummy text	Another dummy text	Another dummy text
Something	Something	Something
Another dummy text	Another dummy text	Another dummy text
Something again	Something again	Something again

Add your timeline here

You can use this slide to show milestones

Or the history of your topic.

It is also useful to show the evolution of historical events.

Just add your text and the related years.

Thank You

The hamburger button is linked to the first slide.

Icons

You can resize them, change fill and / or border color.

Just copy and paste them on the desired slide.