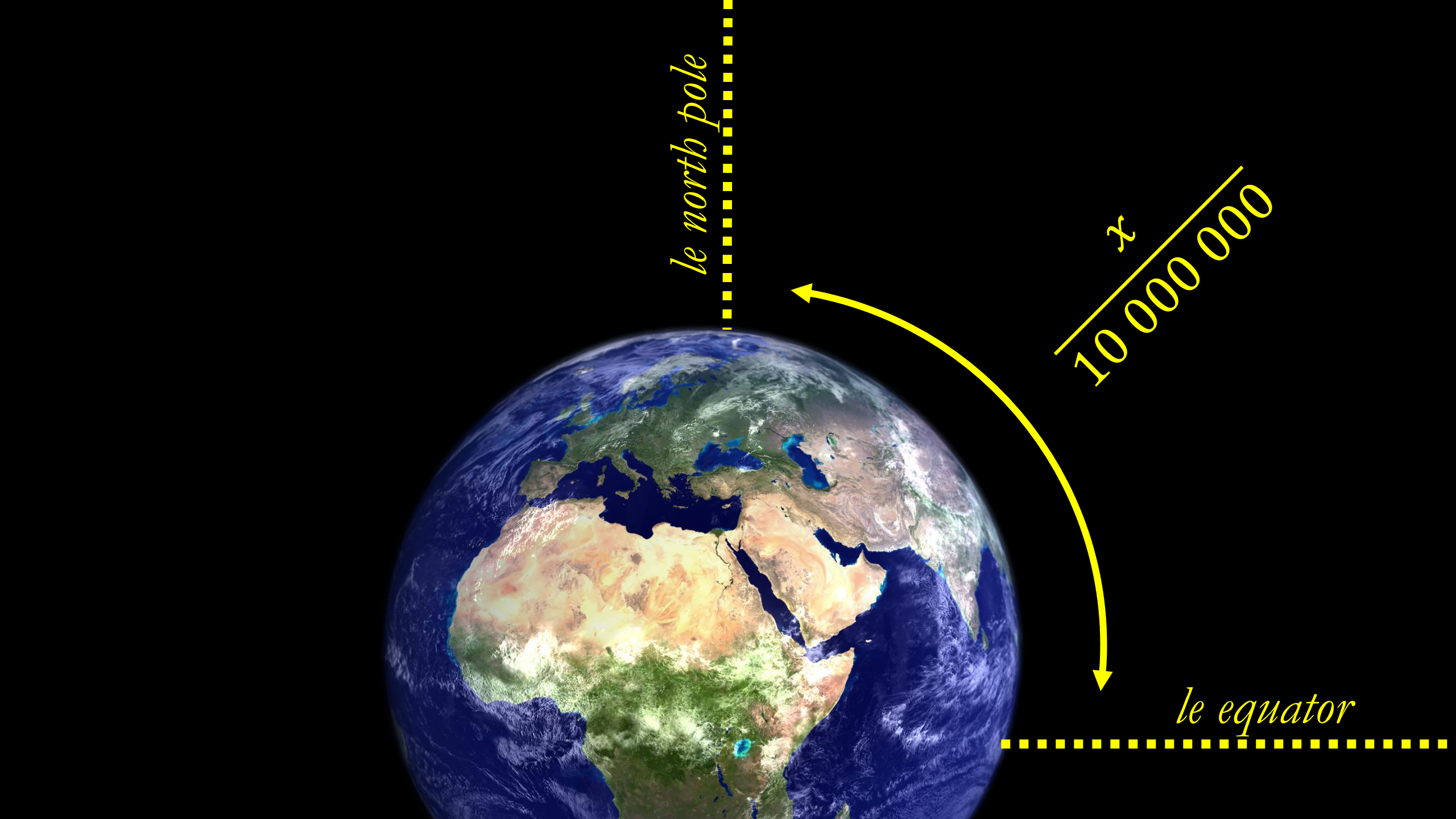
A short history of measurement, and some thoughts on trust and specifications

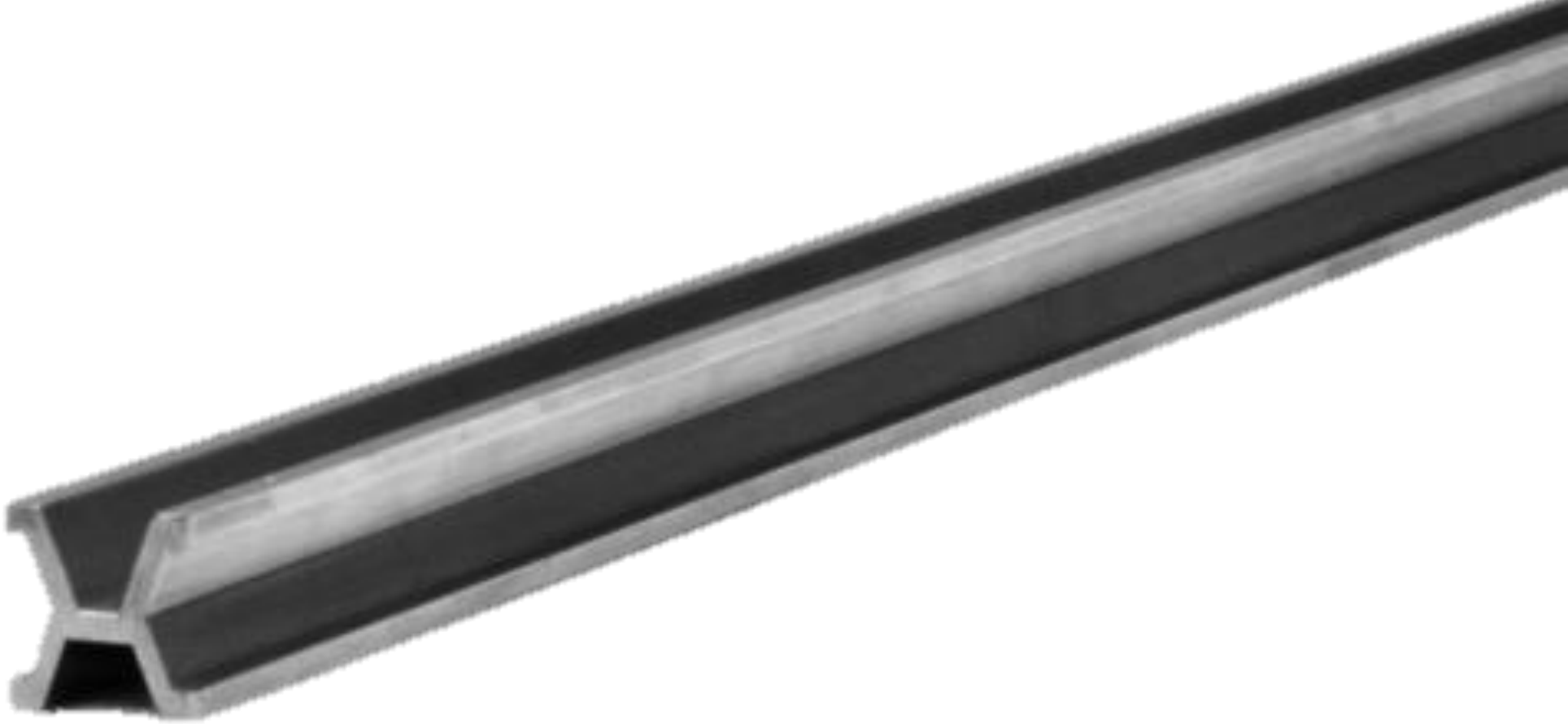
@mirfaan

- Business Analyst
- Product Owner
- STWC runner up!

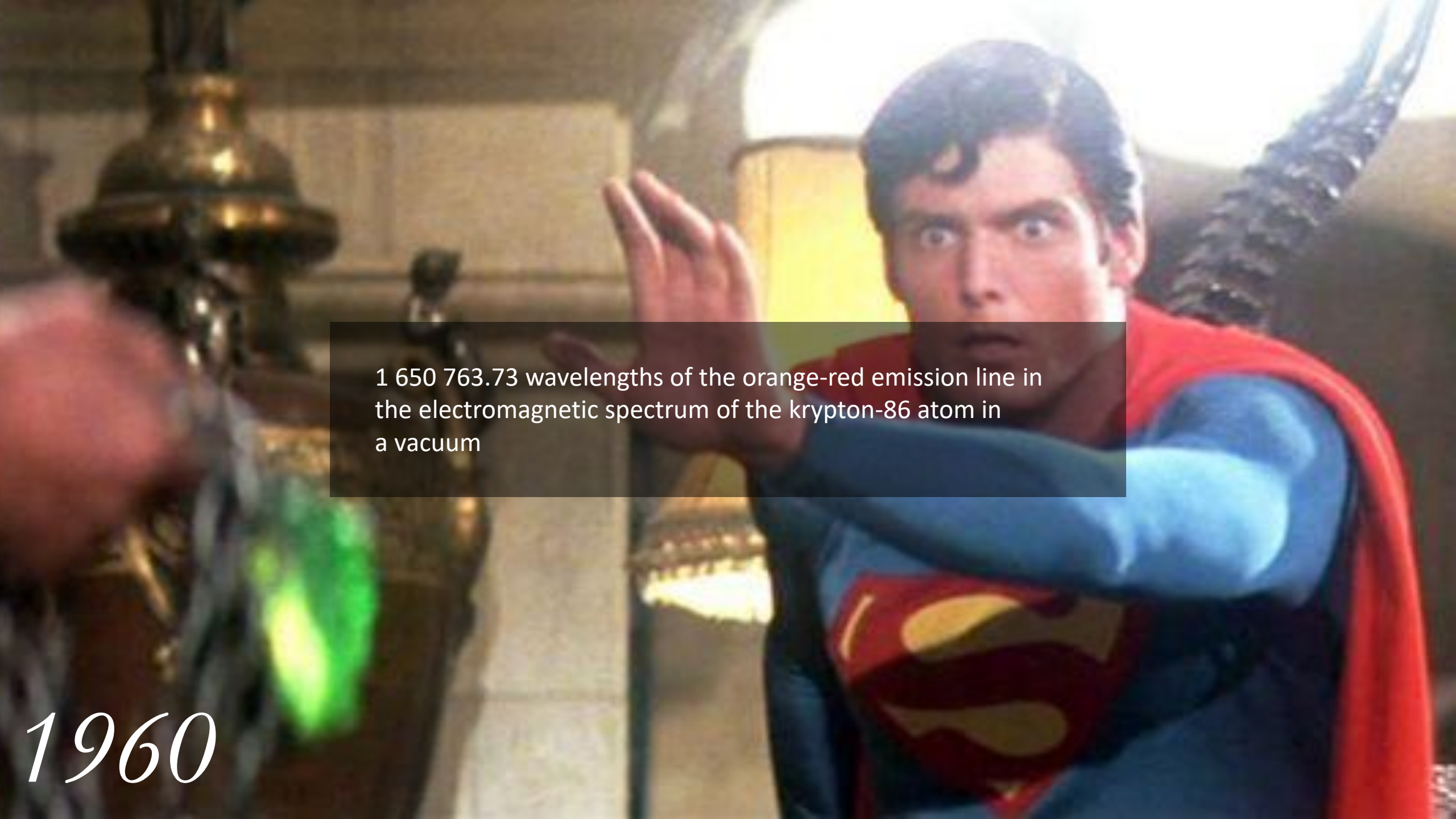
1 metre


le north pole
$\frac{x}{10\,000\,000}$
le equator

1796



1889


1 650 763.73 wavelengths of the orange-red emission line in the electromagnetic spectrum of the krypton-86 atom in a vacuum
1960

Resolution 1 of the 17th CGPM (1983)

considering

- that the present definition does not allow a sufficiently precise realization of the metre for all requirements,
- that progress made in the stabilization of lasers allows radiations to be obtained that are more reproducible and easier to use than the standard radiation emitted by a krypton 86 lamp,
- that progress made in the measurement of the frequency and wavelength of these radiations has resulted in concordant determinations of the speed of light whose accuracy is limited principally by the realization of the present definition of the metre,
- that wavelengths determined from frequency measurements and a given value for the speed of light have a reproducibility superior to that which can be obtained by comparison with the wavelength of the standard radiation of krypton 86,
- that there is an advantage, notably for astronomy and geodesy, in maintaining unchanged the value of the speed of light recommended in 1975 by the 15th CGPM in its Resolution 2 (c = 299 792 458 m/s),
- that a new definition of the metre has been envisaged in various forms all of which have the effect of giving the speed of light an exact value, equal to the recommended value, and that this introduces no appreciable discontinuity into the unit of length, taking into account the relative uncertainty of $\sim 4 \times 10^{-9}$ of the best realizations of the present definition of the metre,
- that these various forms, making reference either to the path travelled by light in a specified time interval or to the wavelength of a radiation of measured or specified frequency, have been the object of consultations and deep discussions, have been recognized as being equivalent and that a consensus has emerged in favour of the first form,
- that the Comité Consultatif pour la Définition du Mètre (CCDM) is now in a position to give instructions for the practical realization of such a definition, instructions which could include the use of the orange radiation of krypton 86 used as standard up to now, and which may in due course be extended or revised

Resolution 1 of the 17th CGPM (1983)

decides

$$\textit{The metre is the length of the path travelled by light in vacuum during a time interval of } \frac{1}{299\,792\,458} \textit{ of a second.}$$

The definition of the metre in force since 1960, based upon the transition between the levels 2p10 and 5d5 of the atom of krypton 86, is abrogated.

Source: http://www.bipm.org/en/CGPM/db/17/1/

Resolution 1 of the 17th CGPM (1983)

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Source: http://www.bipm.org/en/CGPM/db/17/1/

1 second

Resolution 1 of the 13th CGPM (1967)

considering

- that the definition of the second adopted by the Comité International des Poids et Mesures (CIPM) in 1956 (Resolution 1) and ratified by Resolution 9 of the 11th CGPM (1960), later upheld by Resolution 5 of the 12th CGPM (1964), is inadequate for the present needs of metrology,
- that at its meeting of 1964 the Comité International des Poids et Mesures (CIPM), empowered by Resolution 5 of the 12th CGPM (1964), recommended, in order to fulfil these requirements, a caesium atomic frequency standard for temporary use,
- that this frequency standard has now been sufficiently tested and found sufficiently accurate to provide a definition of the second fulfilling present requirements,
- that the time has now come to replace the definition now in force of the unit of time of the Système International d'Unités by an atomic definition based on that standard,

decides

- The SI unit of time is the second defined as follows:

  "The second is the duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium 133 atom";

- Resolution 1 adopted by the CIPM at its meeting of 1956 and Resolution 9 of the 11th CGPM are now abrogated.

Source: http://www.bipm.org/en/CGPM/db/13/1/

1 metre:

The metre is the length of the path travelled by light in vacuum during a time interval of $\frac{1}{299\,792\,458}$ *of the duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium 133 atom*

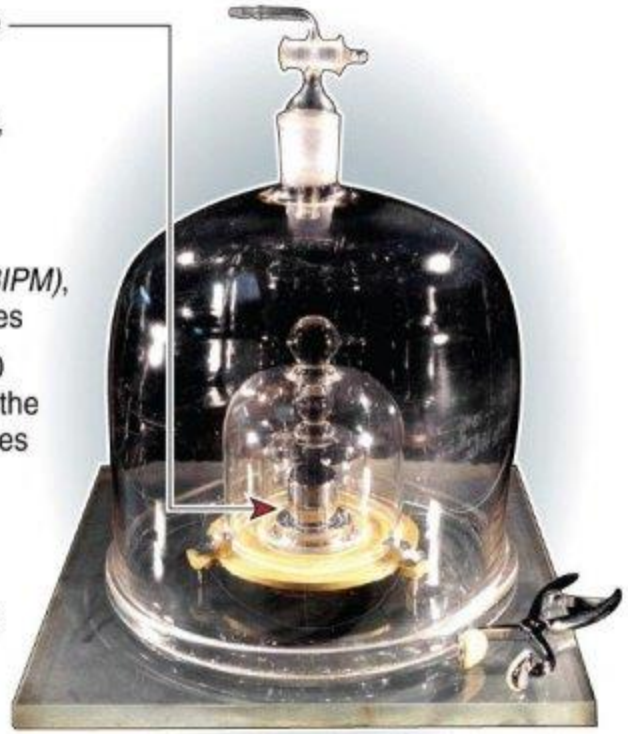
1 kilogram

The kilogramme prototype

The kilogramme is officially defined by a lump of metal stored in a vault in France for more than 120 years under the International System of Units (SI)

The International prototype

- Manufactured in 1889
- Made up of 90% platinum, and 10% iridium
- Kept in a vault at the International Bureau of Weights and Measures *(BIPM)*, along with six official copies
- The basis of more than 80 copies distributed around the world as national prototypes
- Steam-cleaned under strict guidelines on a regular basis
- The last remaining base unit measured against a specific material artefact



The chunk of metal is under triple lock-and-key in Sevres, France

AFP Source: BIPM

https://phys.org/news/2011-11-quandary-kilo-triggers-weighty-reflexion.html


CLOSE ENOUGH.

~~A short history of measurement,~~
and some thoughts on trust and specifications

In order to test something well,
you need to deeply understand the underlying systems,
so that you understand points of integration and edge cases

Sent: 2015

In order to test something well,
You need to deeply understand the underlying ~~systems~~
motivations of the system and users
So that you ~~understand points of integration and edge cases~~
have a framework for dealing with emerging solutions

Sent: 2017

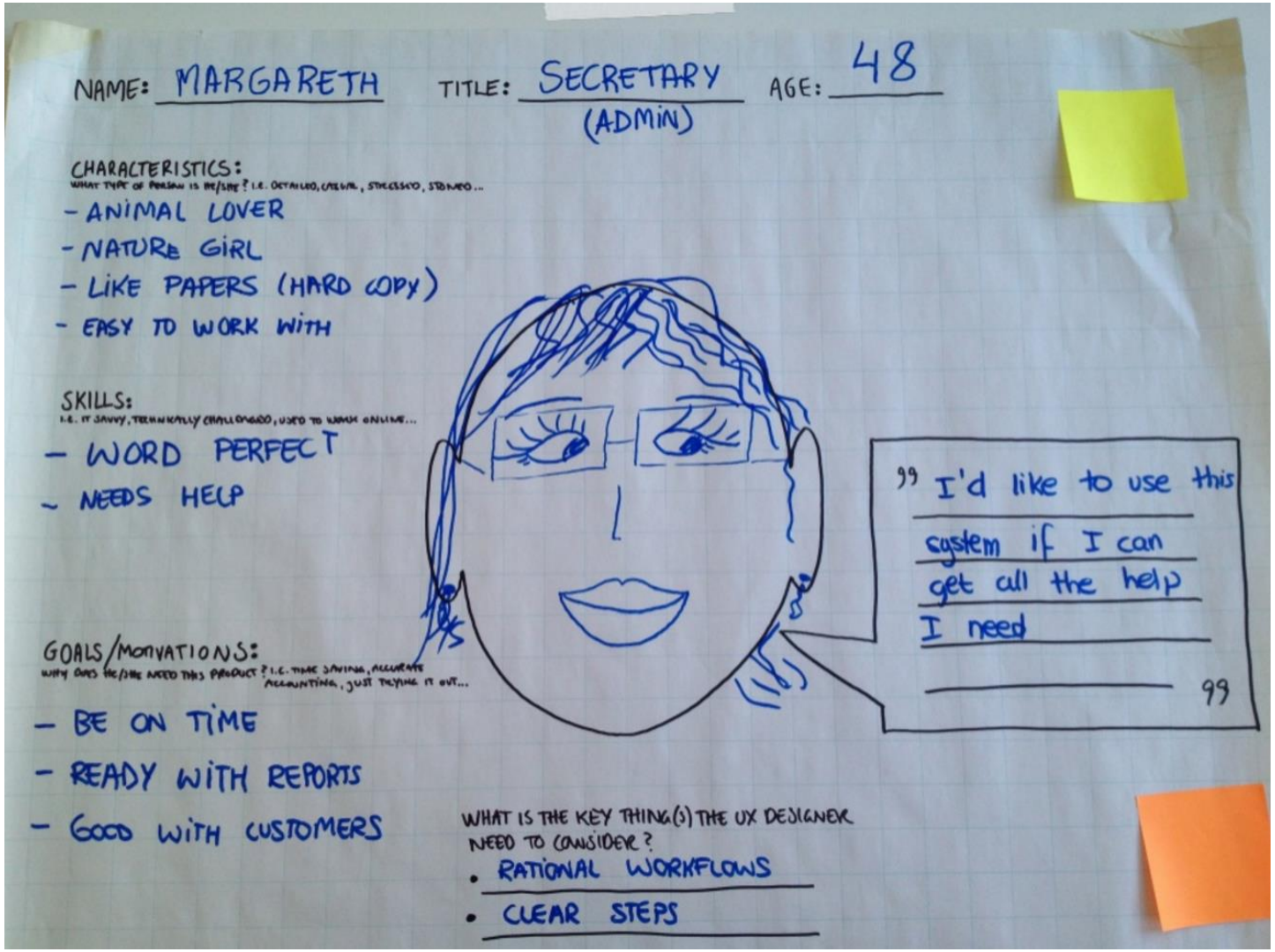
You probably need both

Sent 2019

Motivation

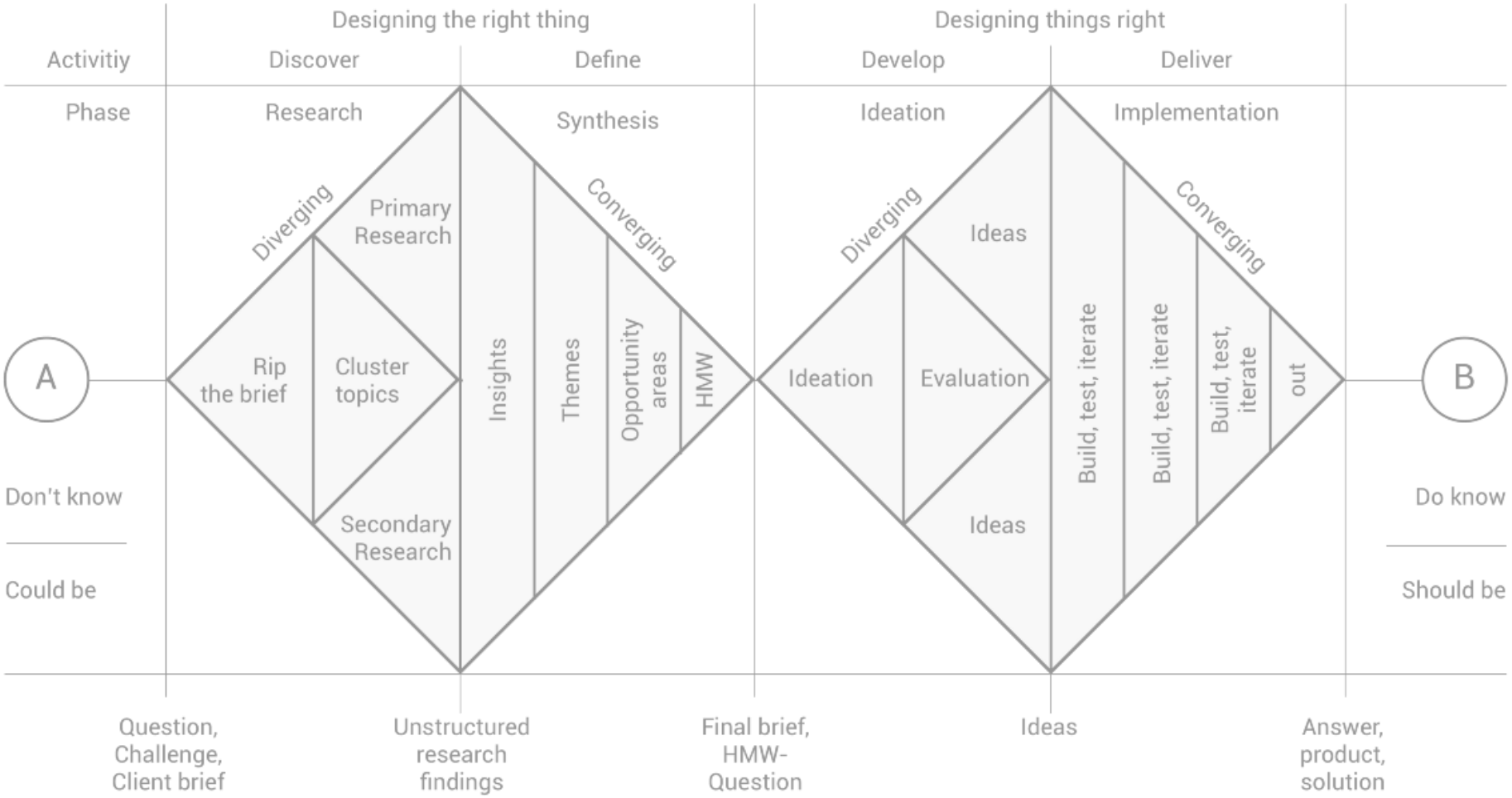
How might we do this?

Personas



http://www.slideshare.net/TheConartist/what-are-personas-and-how-to-use-them-a-presentation-by-shlomo-goltz

Human Centred Design “Design thinking”



https://medium.com/digital-experience-design/how-to-apply-a-design-thinking-hcd-ux-or-any-creative-process-from-scratch-b8786efbf812#.24mfwd31y

User stories

- Titles that are outcome based
- Describe the motivation

- Add a button that is #ff0000 with the word “submit” to the page

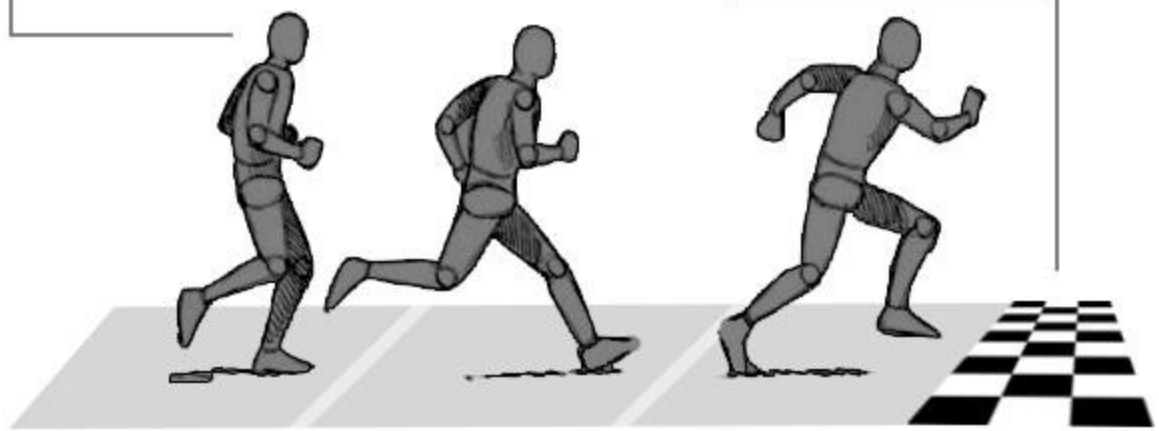
- The user is able to easily see how they can submit their information

1. Persona

Defines who the story is about. This main character has attitudes, motivations, goals, and pain points, etc.

3. Goal

Defines what the persona wants or needs to fulfill. The goal is the motivation of why the persona is taking action. When that goal is reached, the scenario ends.



2. Scenario

Defines when, where, and how the story of the persona takes place. The scenario is the narrative that describes how the persona behaves as a sequence of events.

https://www.smashingmagazine.com/2014/08/a-closer-look-at-personas-part-1/

Examples

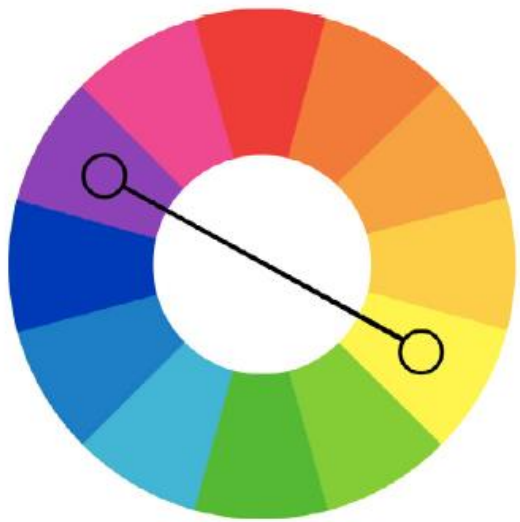
COLOR STYLE THREE

Complementary

Complementary colors are on the opposite sides on the color wheel. Complementary colors should be approached with caution on the web because they create a lot of tension. If you have large areas of the page with these colors, it can hinder communication. The examples below are a few examples that work ok.

POSSIBLE USES:

- **When you want the page to pop**
- **To create excitement if the content of the site is dull**

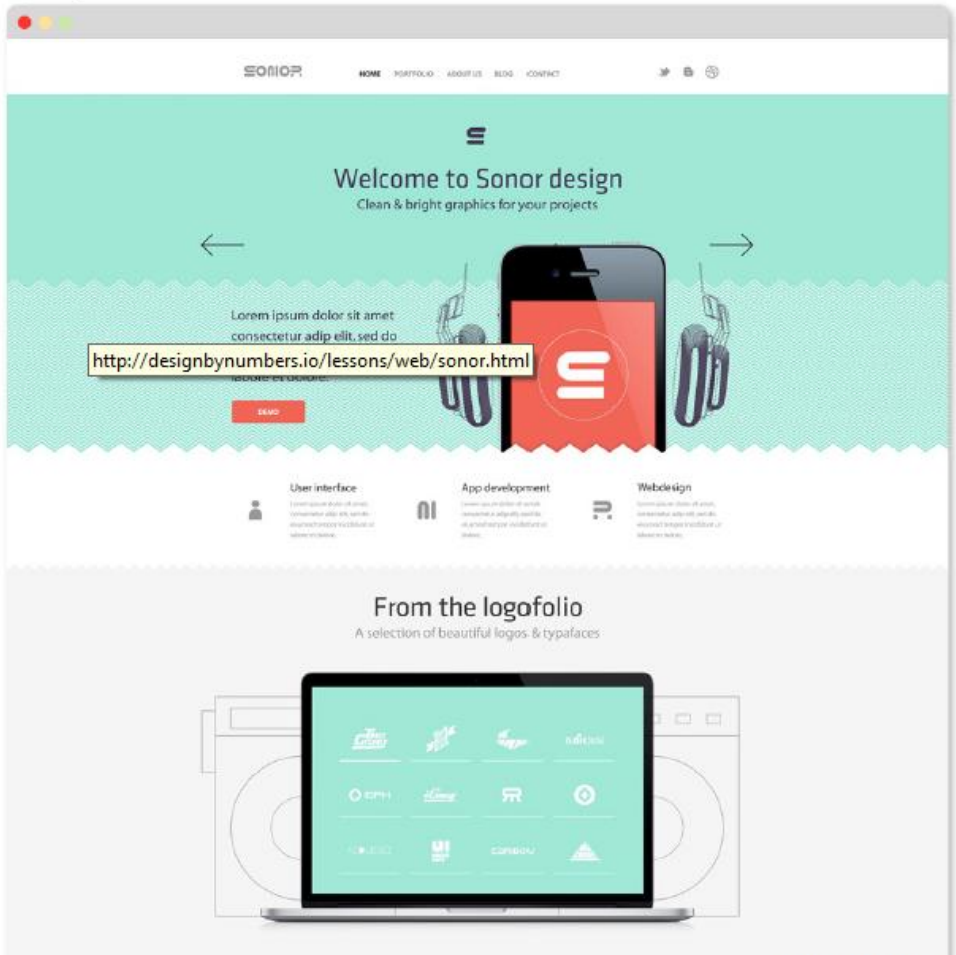


Sonor Design

http://radium.ro/?page_id=530

Here he uses a muted red/orange and a light blue/green. In fact, there's just a hint of blue in there. The design works because the colors aren't too intense.

Enlarge



COMPLEMENTARY

http://designbynumbers.io/media/chapter_eight_color.pdf

LEGAL CONTENT

USER

I need to make sure MailChimp isn't going to steal my content before I send a campaign.

USER'S FEELINGS

- Apprehension
- Confusion
- Vigilance

TIPS

- ✓ Write as calmly and clearly as possible, within the obvious constraints. Only use legal jargon when it's absolutely necessary.
- ✓ Be thorough. Use the sidebar to provide examples and explanations, not summaries. Include links to relevant resources, like other policies or KB articles.
- ✓ Don't dumb anything down or joke around. Legal content is serious business.

MAILCHIMP

You retain ownership of the materials you upload to the Service. We may use or disclose your materials only as we describe in these Terms and our Privacy Policy.

http://styleguide.mailchimp.com/writing-legal-content/

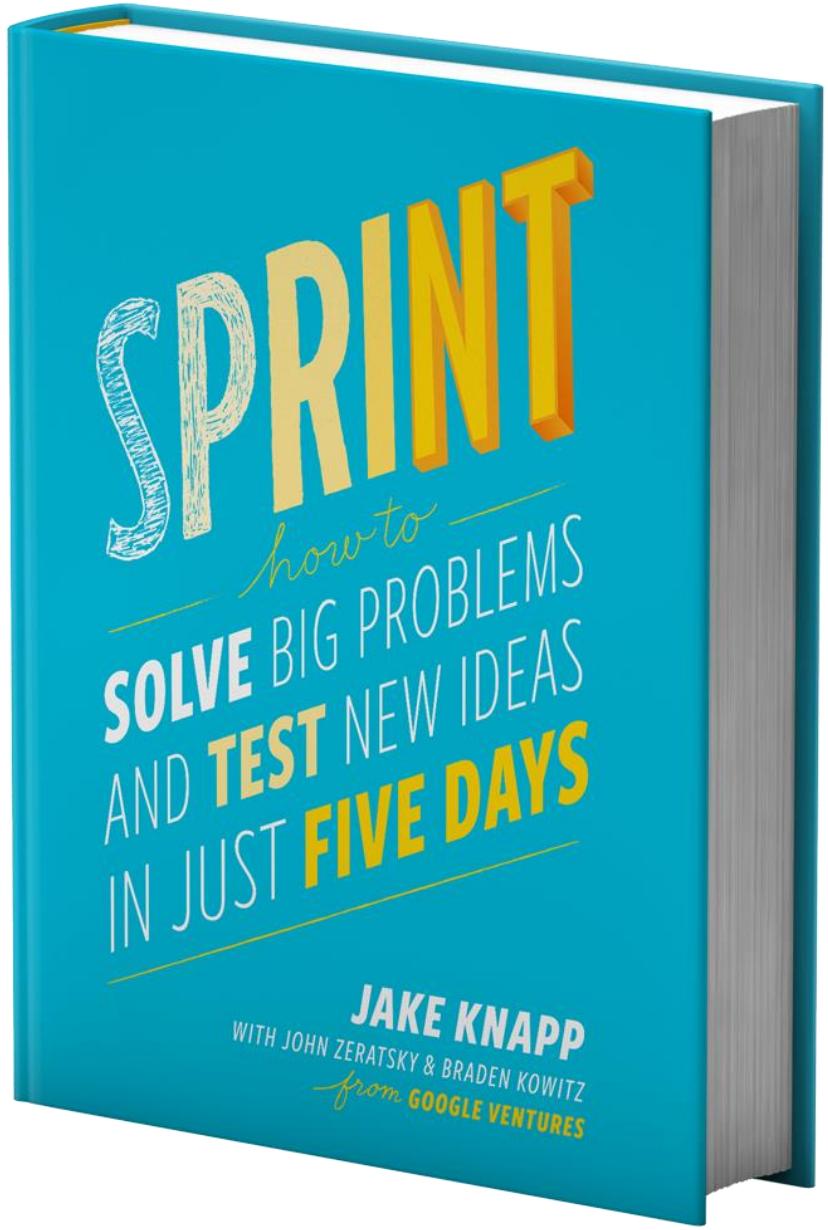
7 Understand context

We're not designing for a screen, we're designing for people. We need to think hard about the context in which they're using our services. Are they in a library? Are they on a phone? Are they only really familiar with Facebook? Have they never used the web before?

- How we recruited people with low/no digital skills on Carer's Allowance, by Simon Hurst
- The right place to do rural research, by Emily Ball

https://www.gov.uk/design-principles

Resources



http://www.gv.com/sprint/

THE CAT ACTION MAP

https://www.frogdesign.com/wp-content/uploads/2016/03/CAT_2.0_English.pdf

There are six activity areas that your group can move through in pursuit of their goal. Depending on your goal, you may need to follow a non-linear path with each activity area. Each time you do an activity, you'll learn something to help you better understand your goals and how to reach them.

Goals change over time, based on how we learn and grow as people. While you will start by setting a shared goal, your group will continuously return to the center of the action map. From the center, you'll be able to assess what you've accomplished and see what still needs to be done.

CLARIFY YOUR GOAL

- Ripple Effect
- Define Your Problem
- Find True North
- Check Your Goal

BUILD YOUR GROUP

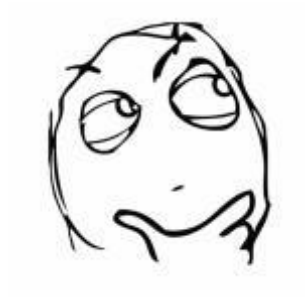
- Skill Share
- Knowledge Hunt
- Who Inspires Us
- Rings of Connection

SEEK NEW UNDERSTANDING

- Find Issues, Uncover Needs
- Interviewing 101
- We Saw, We Heard
- Pattern Quest

IMAGINE MORE IDEAS

- Jam Session
- Idea Remix
- Grow an Idea
- Narrow the Set



Summary


Specification
Story: The user can get from here to here
Actual work done

More about measurement

- RadioLab: http://www.radiolab.org/story/kg/
- Wikipedia: https://en.wikipedia.org/wiki/International_System_of_Units

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https://github.com/cape-town-testing