

Experience Prototyping for Connected Products

O'Reilly Online Conference

Martin Charlier

@marcharlier

m@marcharlier.com

Hello

I'm an independent design consultant
& co-founder of Rain Cloud.

Previously:

- FJORD
(Digital strategy, UX, Service design)
- Random International
(New media art, physical-digital)
- Frog Design
(Industrial design, Design research)

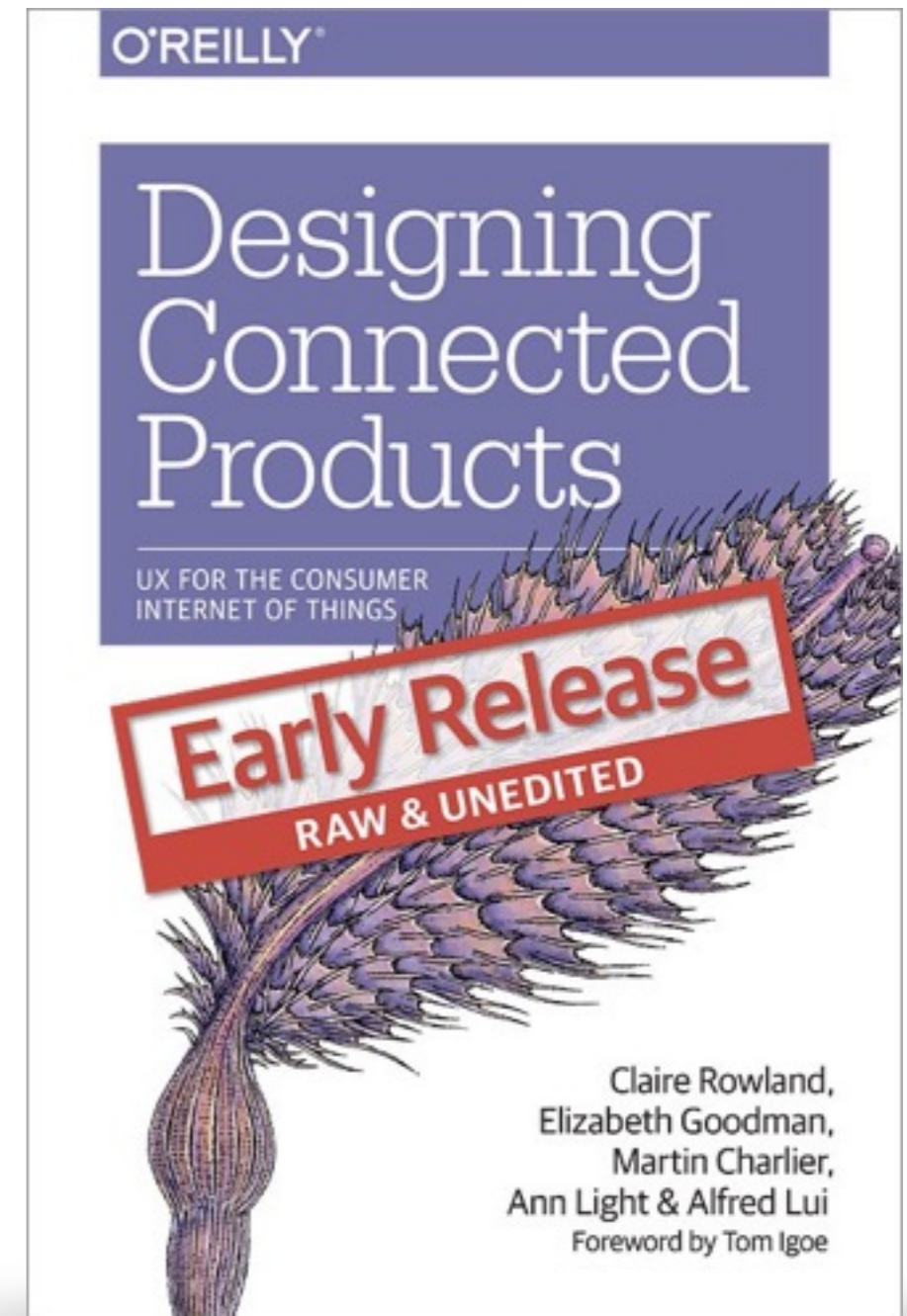


Designing Connected Products

I'm a co-author of 'Designing Connected Products'.

I've written two chapters: One about industrial design and one about interface types.

This talk includes much of the work from my co-author Elizabeth Goodman's chapter 14.



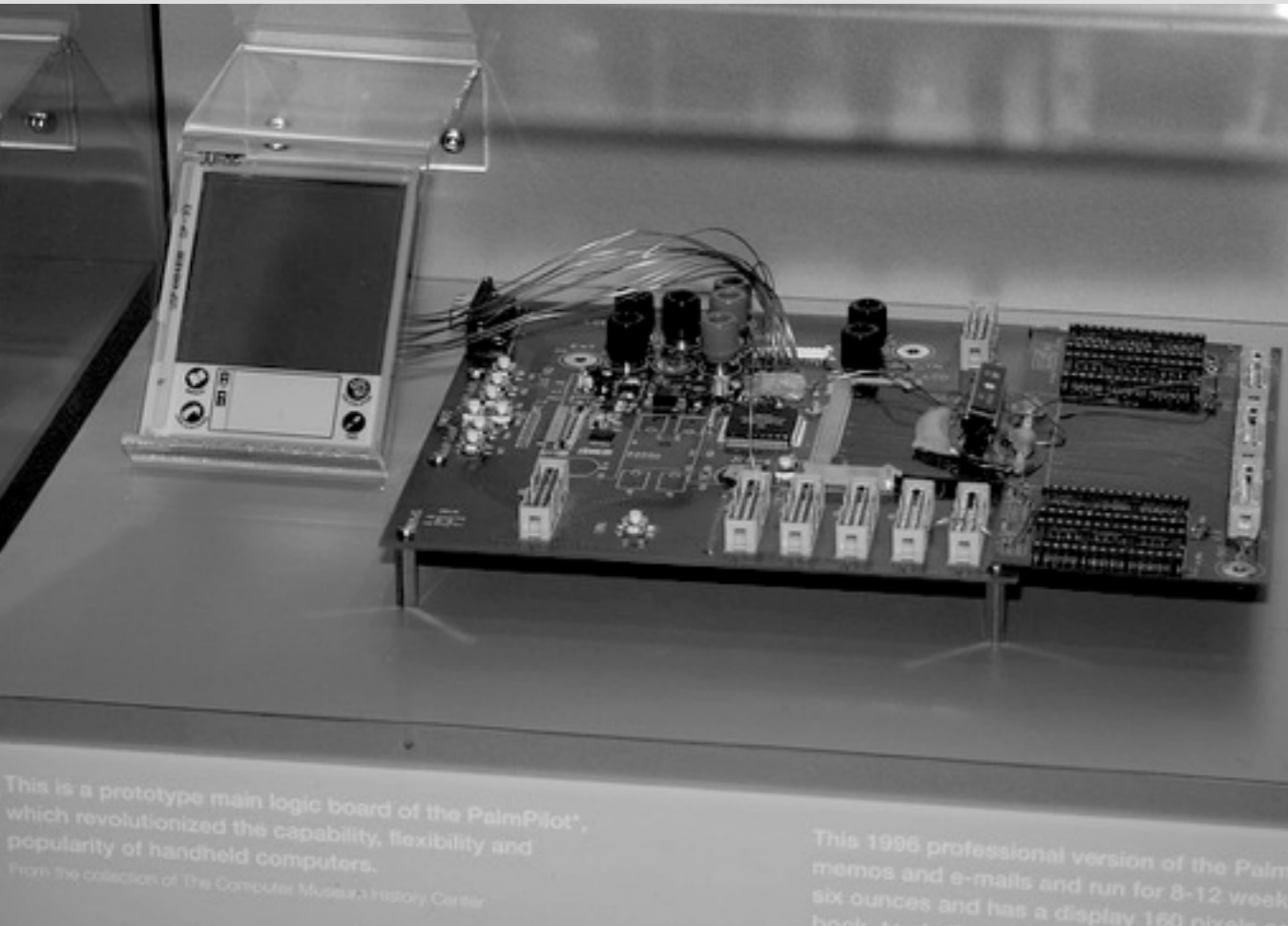
This talk

- Prototyping VS. Experience prototyping
- What's the point of experience prototyping?
- Examples and techniques

“PROTOTYPE”

Experiment designed to answer
specific questions.

PROTOTYPE



This is a prototype main logic board of the PalmPilot[®], which revolutionized the capability, flexibility and popularity of handheld computers.

From the collection of The Computer Museum's History Center

This 1996 professional version of the PalmPilot[®] runs on a 16MHz 68000 processor, weighs six ounces and has a display 160 pixels on a 128-pixel screen.

PROTOTYPE

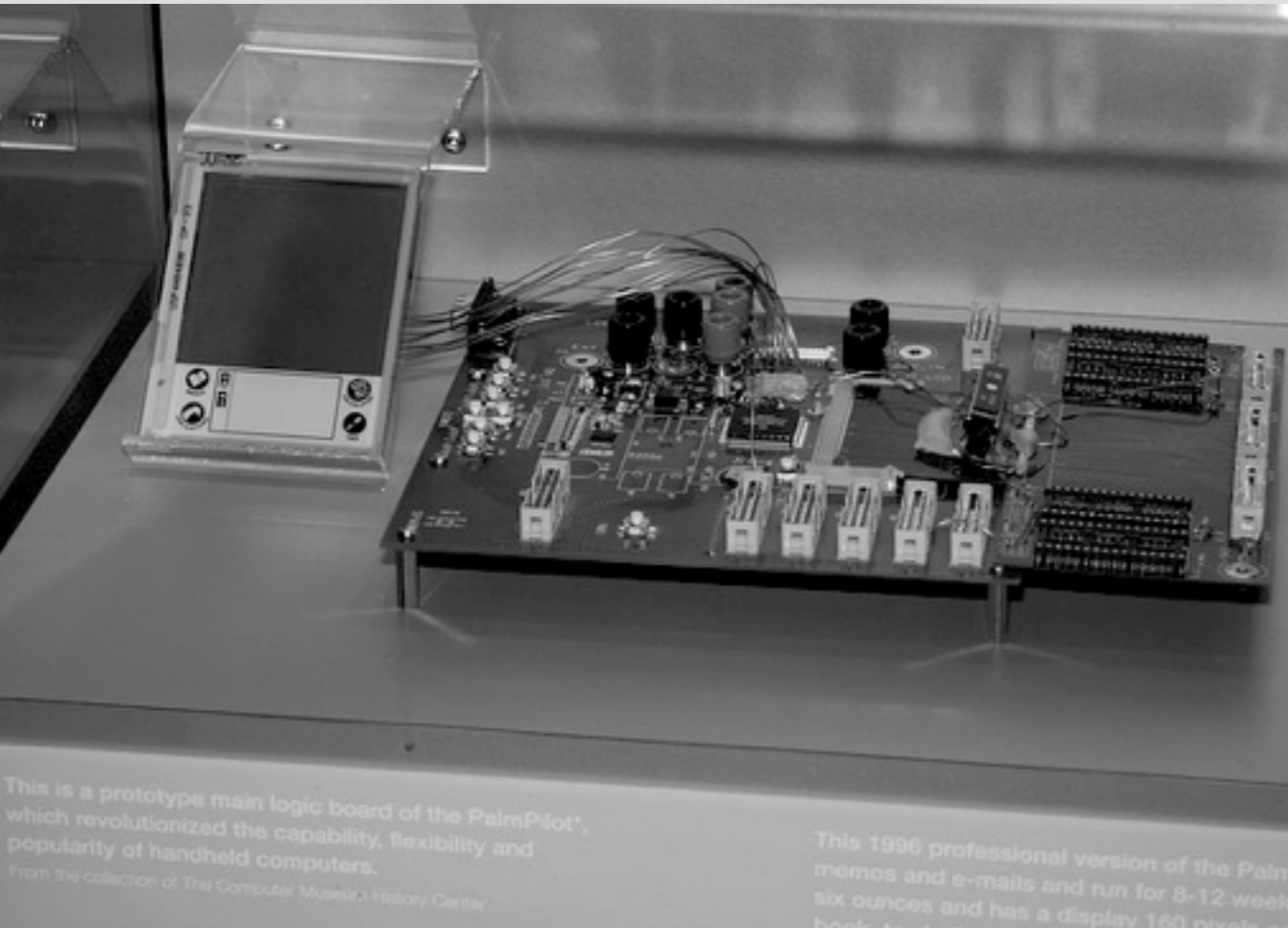


PalmPilot wooden model, Jeff Hawkins, 1995

Jeff Hawkins tested the PalmPilot's design with this model, using a chopstick for a stylus. He took pretend notes in meetings, and counted the steps it took to perform common tasks.

Gift of Jeff Hawkins, 102619074

PROTOTYPE



EXPERIENCE PROTOTYPE



PROTOTYPE

**Building
the thing right.**

EXPERIENCE PROTOTYPE

**Building
the right thing.**

PROTOTYPE

Building the thing right.

What are the tech challenges we will face?

Can we actually make this work with the tech we have?

Will it meet the requirements?

EXPERIENCE PROTOTYPE

Building the right thing.

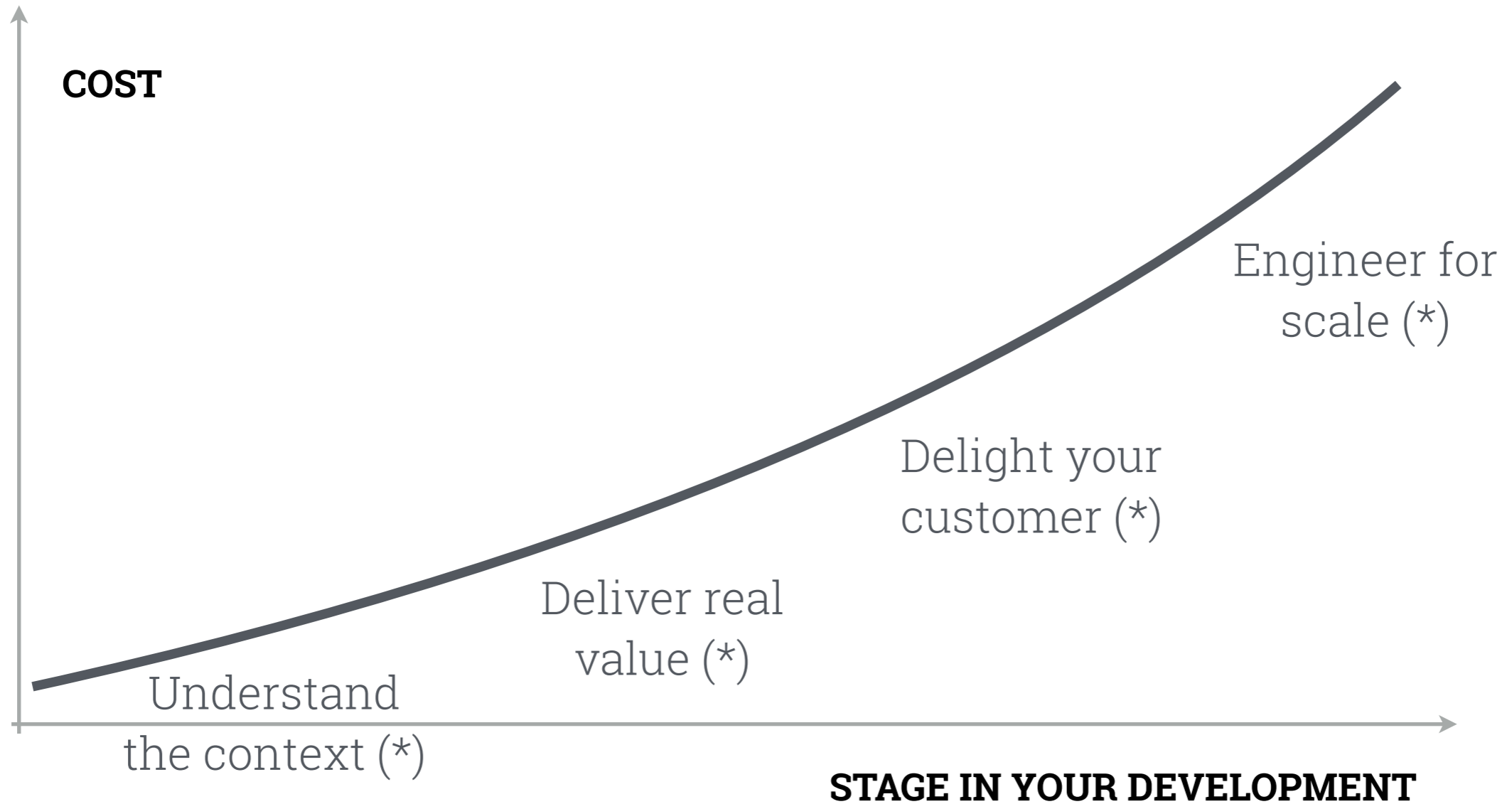
Would people use this?

How would it have to work to be desirable?

Should we build this at all?

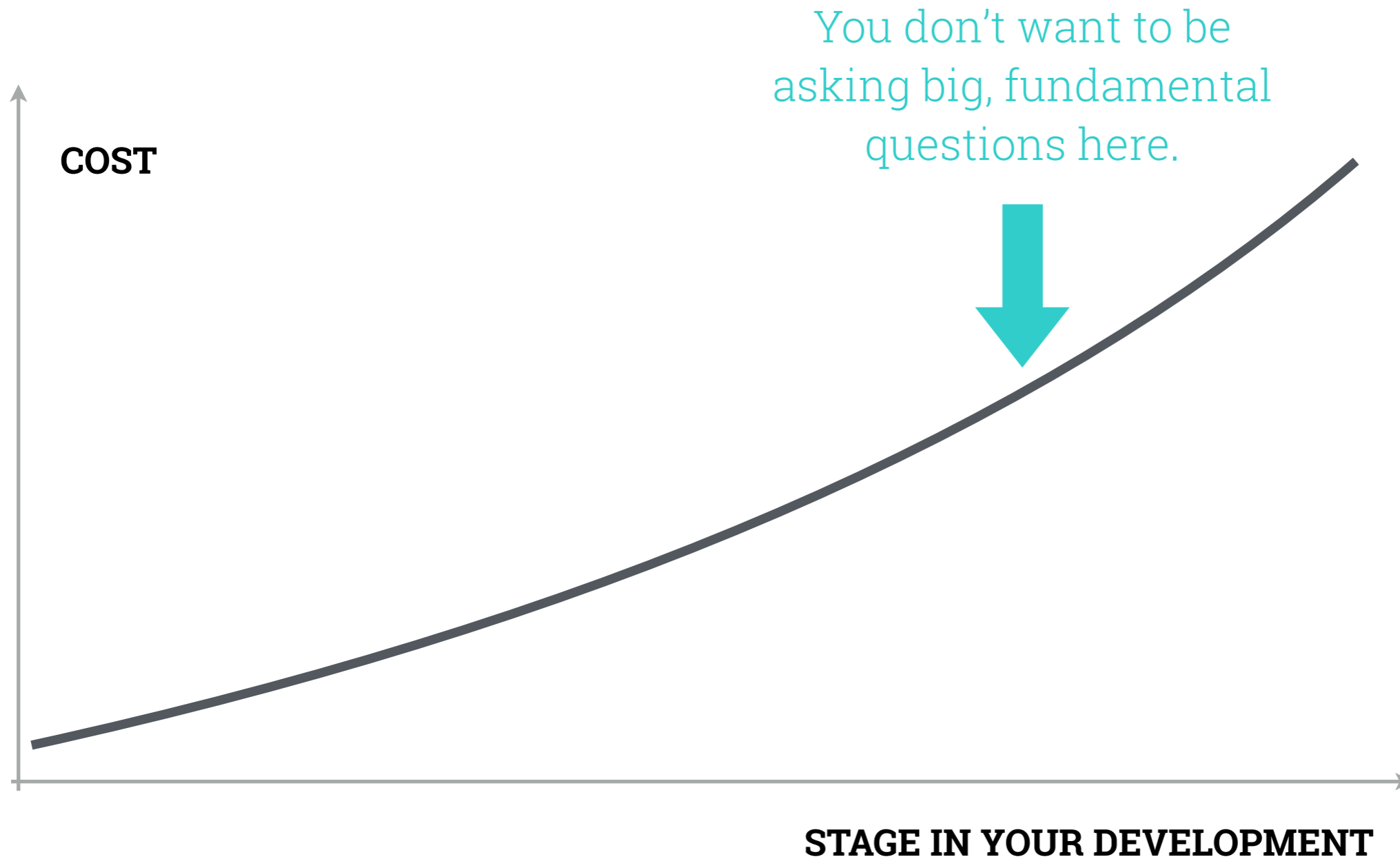
What would it feel like to use this?

Product development



(*) Marcus Gosling (Highway1) at ThingsCon

Product development



Are we building the right thing?



Are we building the thing right?

PROTOTYPE

EXPERIENCE PROTOTYPE

Cost

significant

negligible

Time

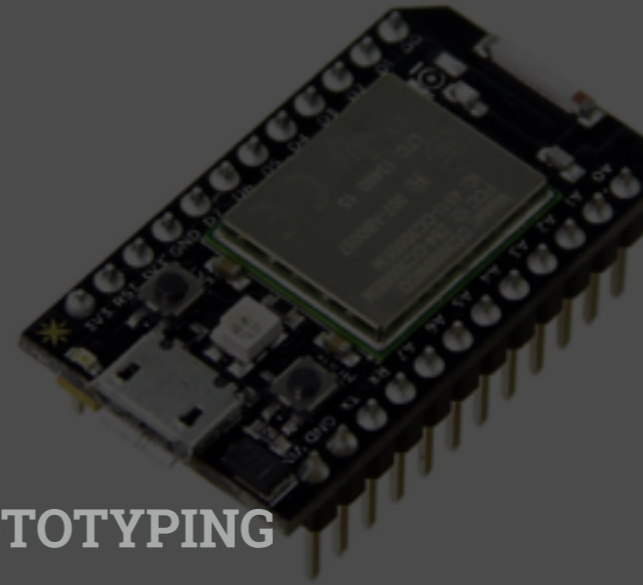
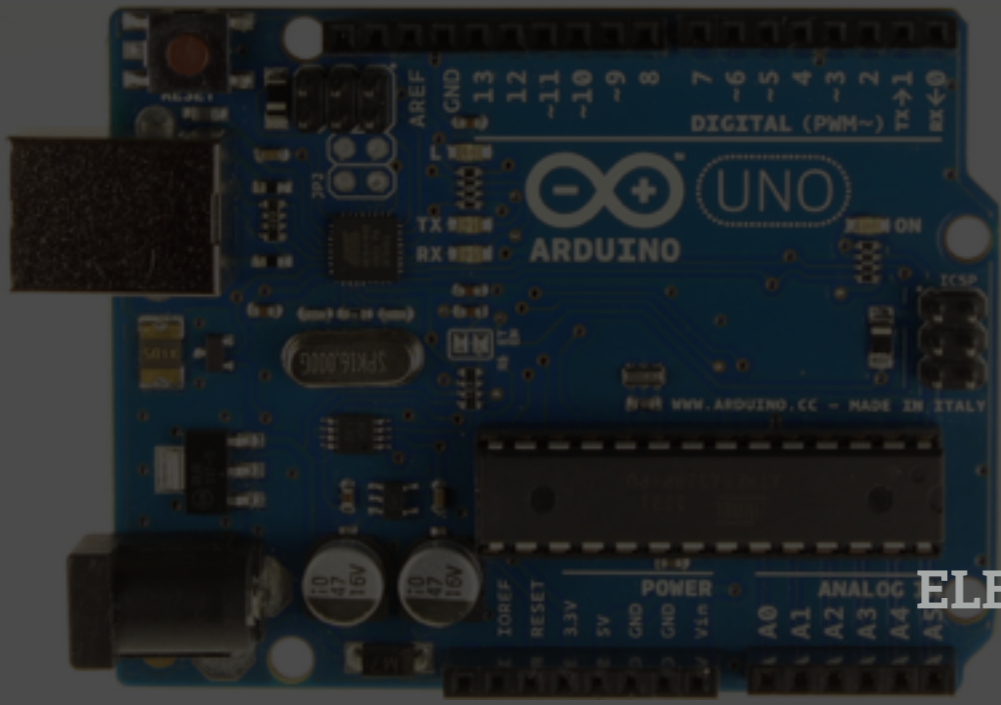
weeks

hours or days

Answers

few & precise

many & rough



ELECTRONICS PROTOTYPING

Even electronics prototyping platforms can sometimes distract and waste time.

"Uh-oh! I've just spend an entire day getting a certain library to work."



A grayscale photograph of a man in a suit and tie, smiling and speaking into a vintage microphone. In the background, there is a typewriter and a control panel with various buttons and a small display. The overall scene suggests a historical or archival setting related to early computing or communication technology.

IBM & SPEECH-TO-TEXT

Let's not bet the company on it...

Prototyping techniques

Media from the future

Storyboards

Physical props

Wizard of Oz

Video prototypes

Prototyping techniques

Media from the future

Storyboards

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Wizard of Oz

Video prototypes

Newspaper article

MELBOURNE
DAILY REPORTER.
Published in Melbourne since 2010 Monday 18th May 2015, 12:34pm \$2 / ¥12

Special edition

How we became a smart city

Melbourne has transformed the way it lives, works, and plays

By Mark Sharp and Abi Davis

MICHELLE is waiting for the imminent 07:23 train from St. Kilda to the city but you wouldn't know it.

She glances shyly at the iPad on the table in front of her and taps the list of her espresso. The iPad's screen indicates a small green dot moving slowly down a map of the area.

The app, powered by the City of Melbourne and State Government's joint open data joint initiative, indicates all her mobility choices, organised around her daily patterns. In this case, it shows her she's got two minutes to get to the train stop a few metres away, and that the train is only half-full.

"It's funny," Michelle says. "This is exactly the same train service I had four years ago, but it now feels like a better service. All because I have the information at hand. I can make the right decisions, for me."

This is a sentiment increasingly echoed by many Melburnians, and not just limited to transport. Across many walks of life in the city, and many daily activities, the city of Melbourne suddenly feels like its infrastructure is as contemporary as that of Singapore, Seoul and Shanghai to the north.

As a result of the initiatives set in place five years ago by the then Lord Mayor Robert Doyle, Melbourne can genuinely claim to be a 'smart city'.

A key early intervention was to connect together the city's various public transit systems via the Myki system, which can now be accessed via smartphones as well as smart cards.

While investment in public transport infrastructure has also increased, the shift in the experience of using it is what has had Melburnians returning to public transport in droves. Trains, buses and trams are now comfortable, switched on experiences which offer services for commuters and others that private cars simply cannot match.

Yet congestion on the roads has also abated due to this up-tick in public transport use and smarter systems managing traffic flow and parking in the city.

The effect on the city's carbon footprint is immediately visible in the landmark installations installed in and around many city streets.

These displays—at once public art and urban interface—have become hugely popular with visitors, tourists and residents, and curiously provide informative and embracing insights into how Melbourne is performing. A particular favourite seems to be the sound installations along the Yarra, which not only indicate noise levels in the city, but also mash-up the sounds of buskers in real time, the number of different languages being spoken at key points in the city, whilst piping in the sounds of other connected world cities from time to time, chosen on the basis of their real-time internet connectivity with the city. Walk past and you hear snippets of Shanghai and Seoul, The Beatles and Lady Gaga, Flanders Lane and the Roxy from AAMI Park. It literally speaks of Melbourne in the 21st century.

The roll-out of free public wi-fi across the city, combined with some bespoke-Council-run co-working hubs, has led to people being able to shift much of their work closer to where they live, with numerous benefits in terms of health, sociability, traffic and carbon.

Importantly, understanding carbon had been brought to the forefront of people's lives throughout a series of activities and services for Melburnians. Some of these build on smart meter data, while others draw from the huge numbers of other sensors, which are easily identifiable in City of Melbourne livery and dotted around the city.

It's unclear where all this might end. Municipal waste collection has been radically improved due to better data. Complaints to the City are down, as many citizens are able to collaborate on 'urban fixes' through their own neighbourhood portals, yet the complaints that are made can be tracked in detail and are used strategically by the city.

Activity on city streets has increased, thanks to the wi-fi augmenting the city's already-excellent street furniture and urban design, as well as programs like the 100-Cycles project, which has seen the city's 'green infrastructure' heavily used and carefully maintained by a connected 'Green Army' of volunteers.

Numerous other social innovation campaigns are being coordinated online, many of which are powered through the City's web services and open data feeds.

The Real-time Melbourne city model has become the core interface for citizens, app-makers, government strategists, and other roles, all keen to learn from how Melbourne has wrangled its data into smooth-running public services and urban experiences.

This combination of better city services and better visualisations conveying the way the city is performing has helped make real progress against the city's previously unenviable carbon profile.

While some have questioned whether the Melbourne Smart City program should have been a municipal priority, few have actually criticised the approach in practice, particularly when it became clear how quickly and cheaply—relatively—the experience of living in Melbourne could be transformed through smart technologies.

Through a considered combination of these technologies, and people-centred and joined-up governance perhaps unusual to Australia, Melbourne managed to demonstrate how a series of rapid-fire exemplar projects might quickly coalesce to form better public services, and become something bigger than the sum of its parts.

While it clearly enables a more efficient form of government, it also seems to suggest an expanded role for government into places the private sector wouldn't reach. Melburnians ultimately do seem to trust the City with their public data—at least compared to the alternative. Smart and professional handling of privacy and the ethics surrounding data capture has probably been instrumental here.

This public data has then been made available to app developers and others—in Real-time Melbourne—such that the average punter in Melbourne has access to an extraordinarily rich set of apps that provide new interfaces and activities onto their city.

It has also meant that Melbourne is now recognised globally as a key city in terms of software development and urban innovation. The tech sector here is thriving, and in ways that are obviously beneficial to citizens over and above its direct economic impact.

Michelle waves as she signs up onto the train, pleased that her app delivered accurate results. Not least because she designed it herself.

Continued page 6



Questions

- Can this service, idea or product be plausibly conveyed?
- Are we able to convey the idea in simple terms?

Press release

[YOUR COMPANY NAME]
Company Slogan
Street Address
City, State 01234-0000
(000)000-0000
email/web address

PRESS RELEASE

For Immediate Release
For more information contact:
Company
Phone: (800) 985-2000
Fax: (800) 985-2001
Email: name@company.com

TYPE HEADLINE HERE

Type sub-headline here

City, State (April 23, 2012) – [COMPANY], the maker of [SPECIFY], has launched a new website, [ADDRESS] a site aimed at [SPECIFY].

The new website combines a comprehensive listing of [SPECIFY] and a directory of [SPECIFY]. The site will be of tremendous value to entrepreneurs, business professionals and small businesses. "This is a cutting edge Internet site far superior to anything in the marketplace," said [NAME], the President of [PRODUCT]. "We expect tremendous sales through our convenient, user-friendly website."

More than [NUMBER] business are looking for that kind of solutions in [COUNTRY]. "With [PRODUCT], many business owners and entrepreneurs will now be able to [SPECIFY]," said [PRESIDENT].

[Company] is the owner of the popular [SPECIFY]. Its [PRODUCT/SERVICE] is known for [SPECIFY]. The company's mission is to [SPECIFY] and currently employs [NUMBER] people in the greater [CITY] area and has won numerous local awards for its [PRODUCT/SERVICE]. The company's website at www.company.com contains additional information.

- 30 -

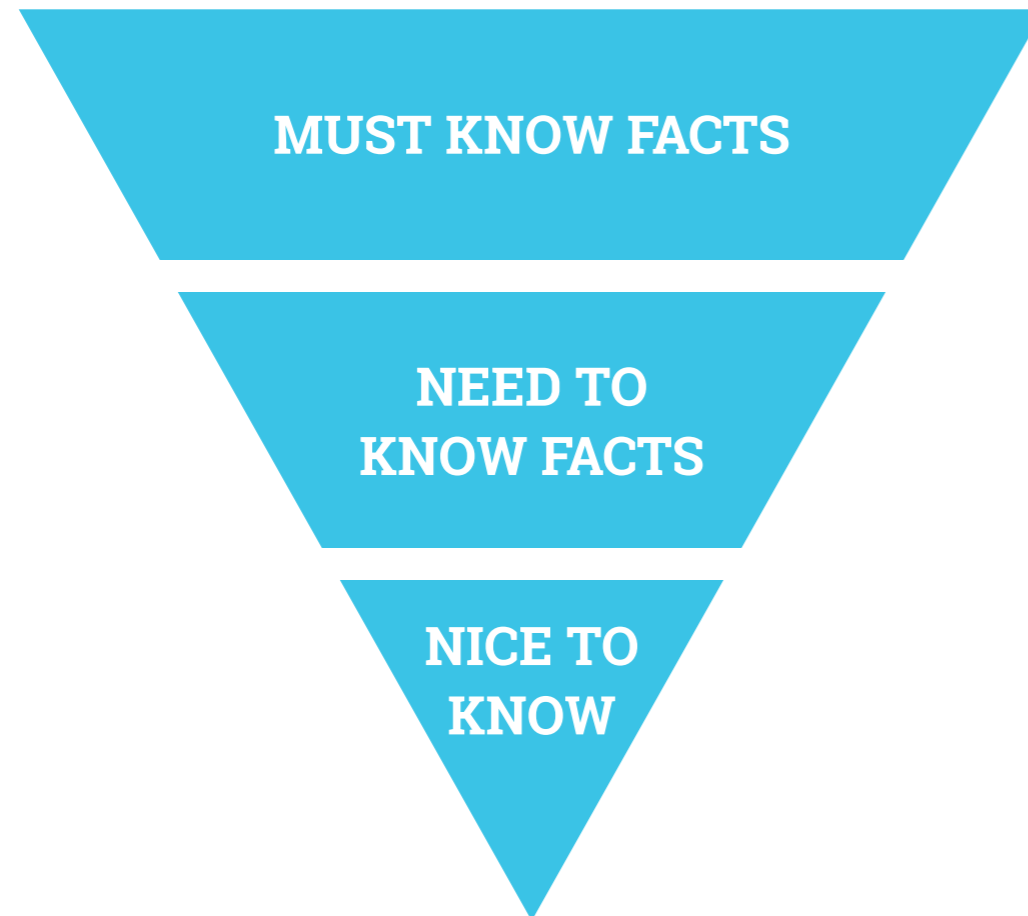
- Forces you to clearly and simply convey the value and why anyone should care.
- Can be iterated quickly.

Amazon product development: <http://www.quora.com/What-is-Amazons-approach-to-product-development-and-product-management/answer/Ian-McAllister>

More on Amazon: <http://brendansterne.com/2013/11/21/amazon-product-management-working-backwards/>

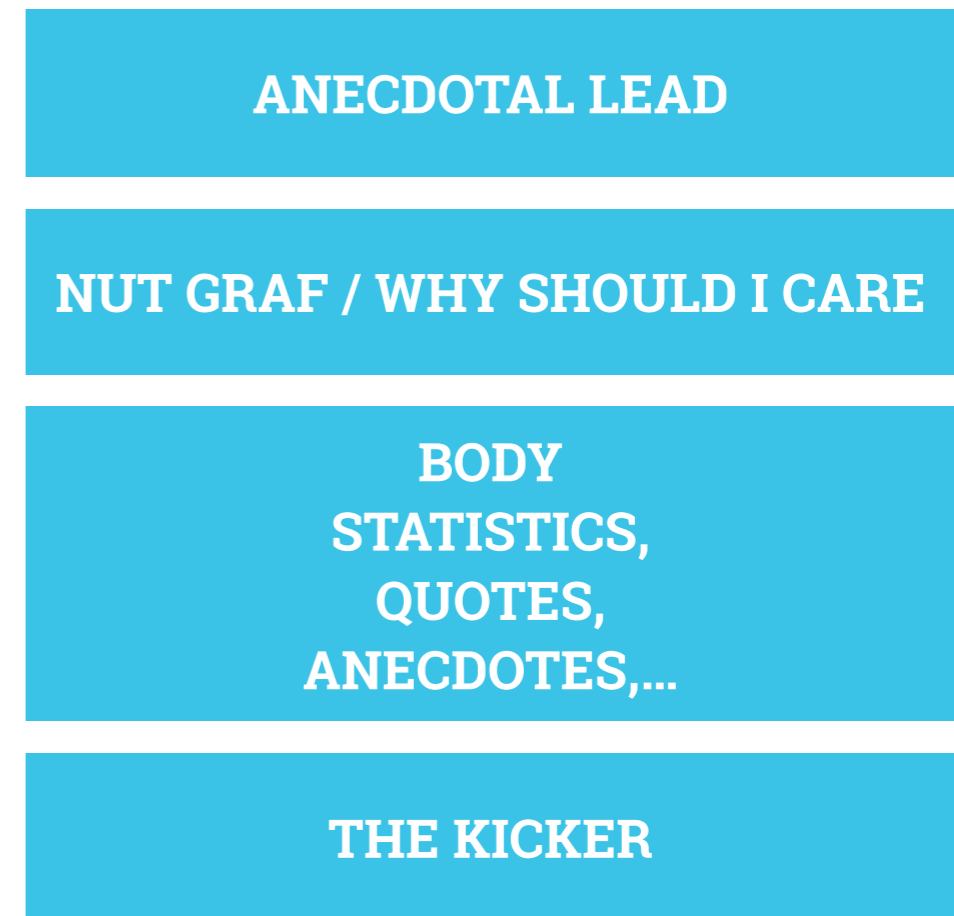
Writing structures to get started

Inverted pyramid



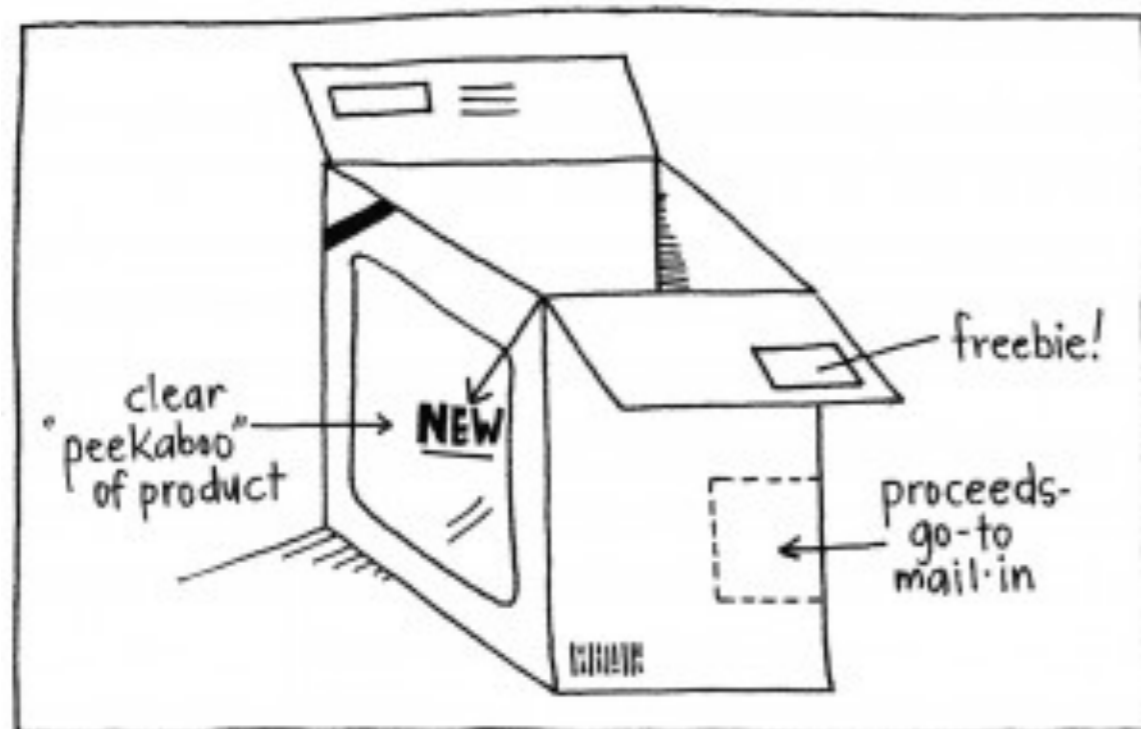
- Press release
- Audience might stop reading any time

Doug McGill's Four-Box structure



- Feature article
- Reader is persuaded in by a compelling narrative
- Nut Graf: Nutshell Paragraph, why should you care?

Sketch-the-box / Sketch an advert



Questions

- Why should people care?
- How do you persuade them?
- How can you proof your claims?

Reading sequence of a shopper

THE SHOPPER:

- ① Notices the package
- ② Asks “What is it?”
- ③ Wonders “Why should I care?”
- ④ Wants to be persuaded
- ⑤ Needs proof

NOTE

Once you're happy with what you produced, these media can also be a great way to capture the vision behind a project.

Media from the future: Summary

- “If you can’t explain it simply, you don’t understand it well enough yet”
- Test if an idea can be plausibly explained or conveyed
- Iterate quickly
- Capture the ambition/vision of the project

Prototyping techniques

Media from the future

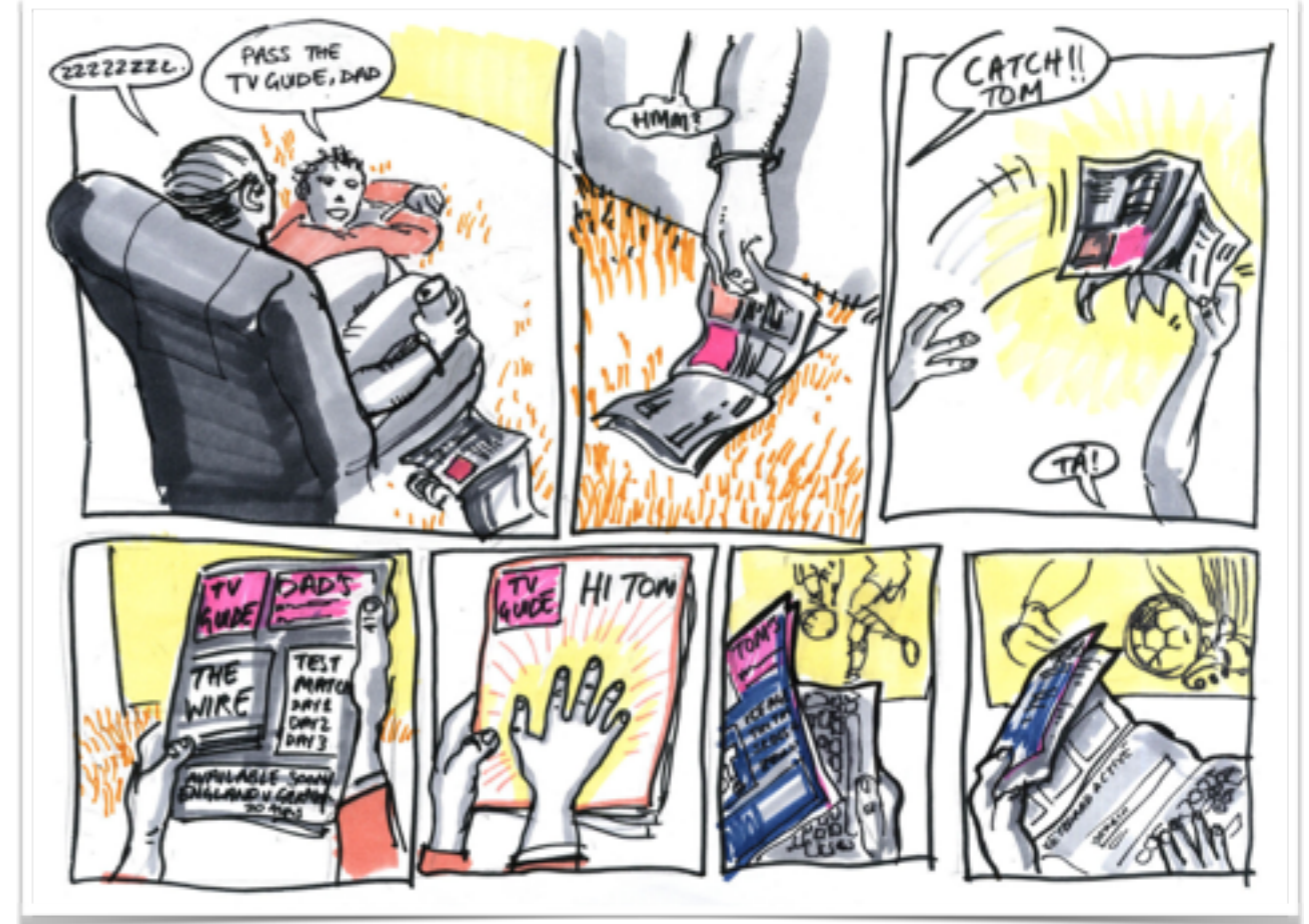
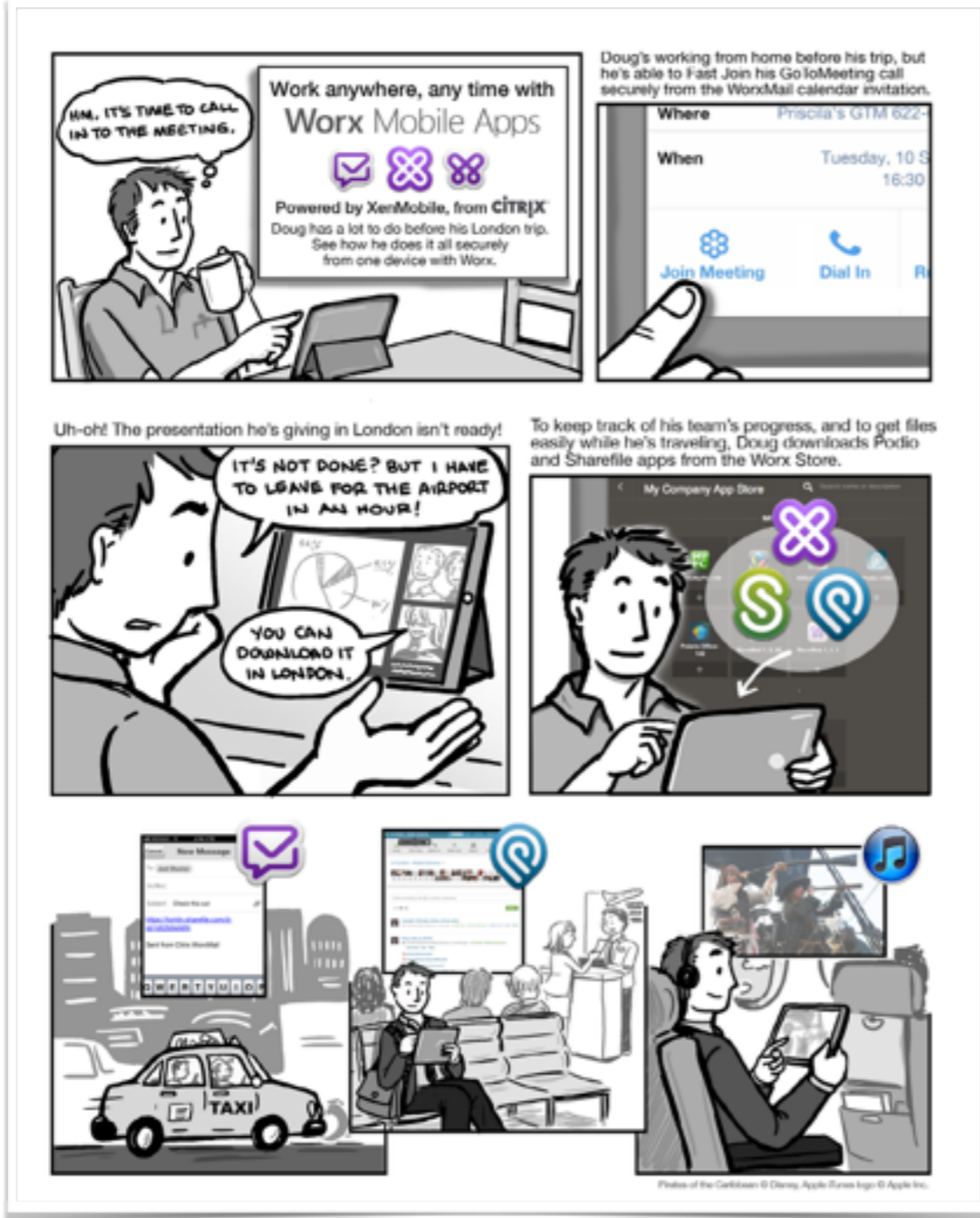
Storyboards

Physical props

Wizard of Oz

Video prototypes

Storyboard



Storyboards: Summary

- In making it, you work through how different systems work together.
- Forces you to think about context of use
- Useful foundation for video prototype.

Prototyping techniques

Media from the future

Storyboards

Physical props

Wizard of Oz

Video prototypes

Physical props / 1:1 mockups



Credit: Stimulant



Credit: D-LABS

Physical props / 1:1 mockups



Physical props: Summary

- Work in 1:1 scale to experience the context and uncover ergonomic considerations.
- Don't waste time over-designing them. This also risks drawing attention to the wrong areas.
- Adapt working devices instead of building custom electronics prototypes.
- Internal to iterate, but also a great foundation for user research, Wizard of Oz, or Video Prototypes.

Prototyping techniques

Media from the future

Storyboards

Physical props

Wizard of Oz / Mechanical Turk

Video prototypes

Wizard Of Oz

- A (hidden) human plays the role of the system or technology.
- The user can experience and react to a product concept even though its technology is unproven.



User experiencing the prototype.

Credit: Ericsson Labs, Marcus Nyberg



Behind the scenes triggering based on user action.

NOTE

Lessons about the UX can inform the technical requirements, not the other way round.

Experience prototyping in research



Wizard of Oz: Summary

- (Hidden) human simulates part of the system
- Can be used in a few ways:
 - Live enactment to test with users
 - Demonstrate to onlookers / stakeholders
 - Across multiple days and locations to do user research.
 - Filmed and turned into a video prototype showing the experience in a plausible way

Prototyping techniques

Media from the future

Storyboards

Physical props

Wizard of Oz

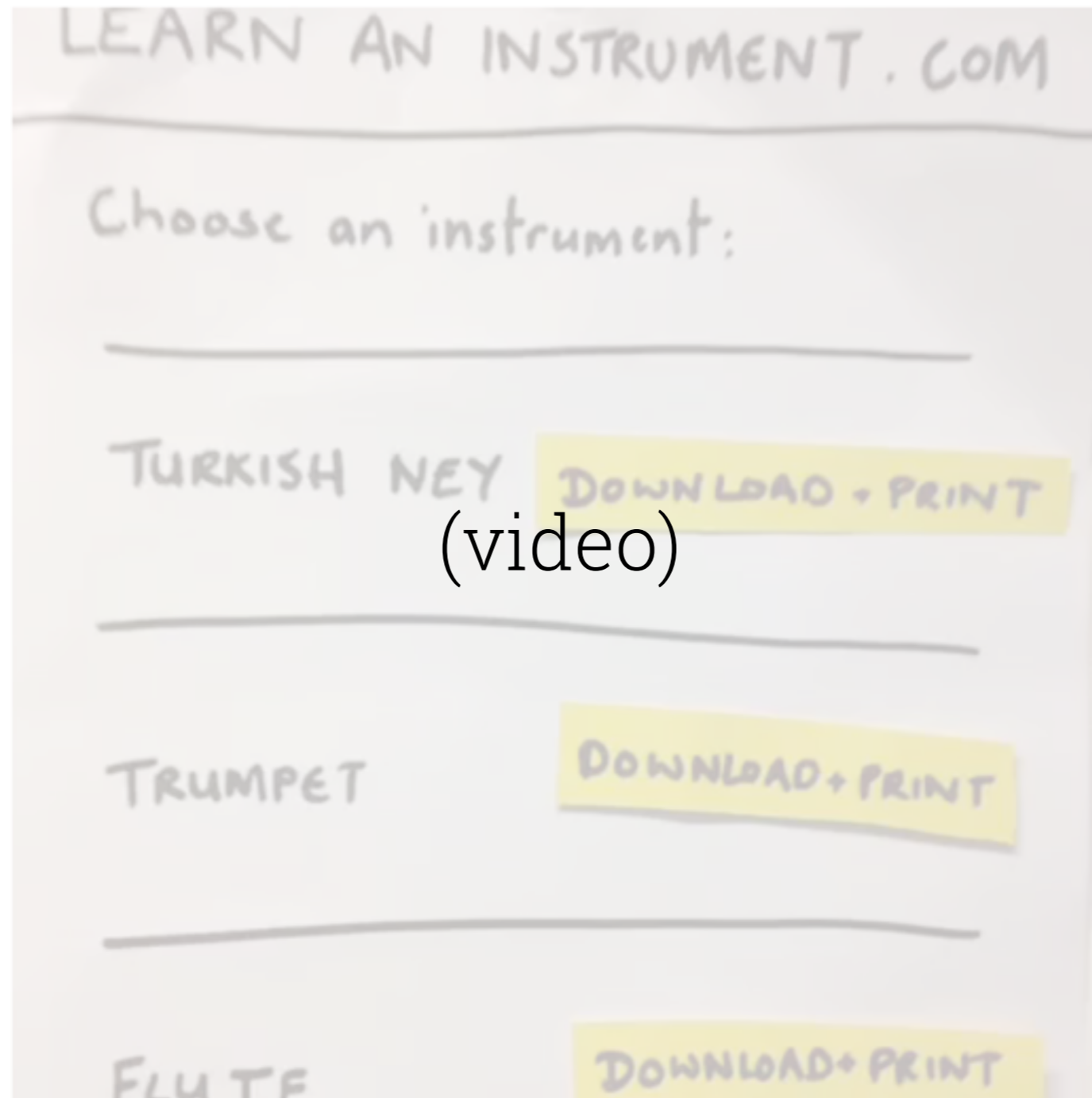
Video prototypes



**These are NOT video prototypes.
(These are concept videos...)**



Vine prototype

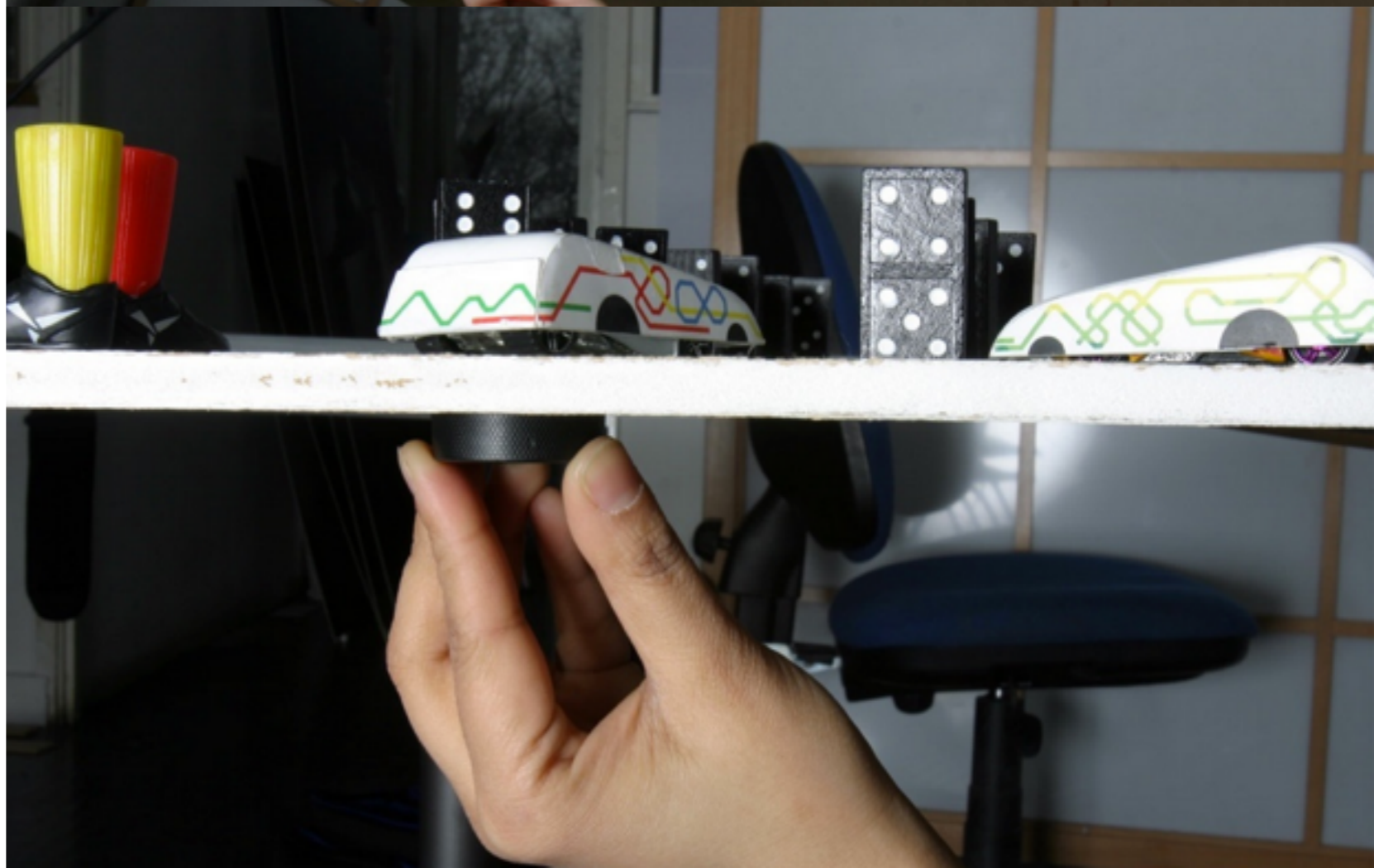
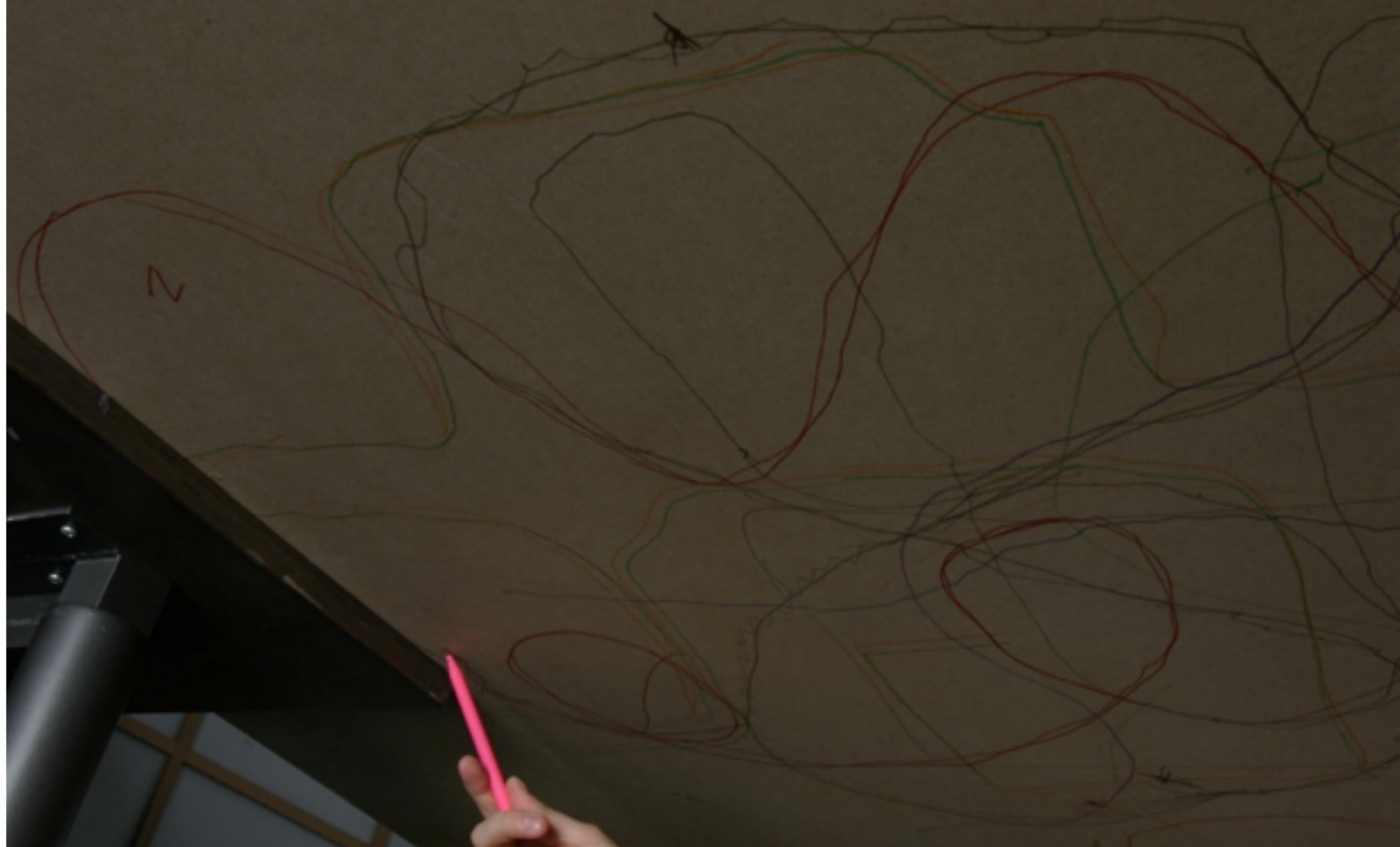


(video)

Video prototyping



Video prototyping



<http://www.superflux.in/work/sketch-move>

NOTE

This can be a powerful way of capturing the ambition and uniting a team. The video then becomes inspiration and goal post during the further development.

Rough prototypes inspired by the initial video prototype

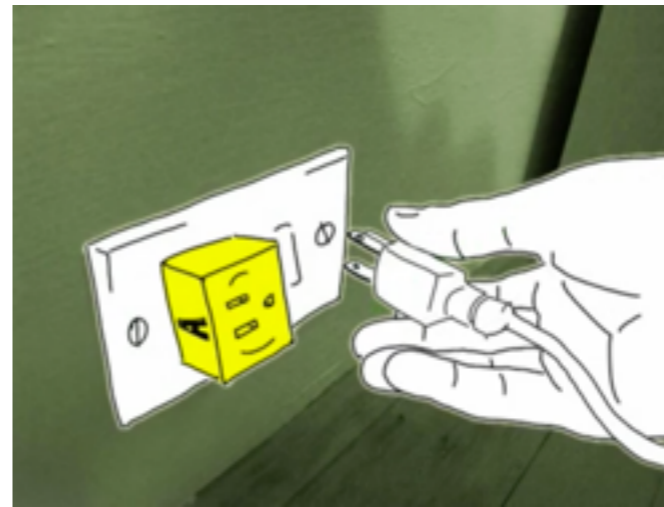


Video prototyping



(video)

A storyboard or video prototype can guide the tech requirements



Technology requirements



Technology requirements



Technology requirements



Technology requirements

Video prototyping: Summary

- Builds on Physical props and Storyboards
- Can be:
 - Live action role playing
 - Stop motion with Lego, etc
 - Still montages turned into a film
- Keep it sketchy: Don't over-design or mis-direct attention.
- Helps you experience the physical context.
- Can be a vision to inspire and unite the team.
- Can be used to derive tech requirements.

Summary

Investigating and iterating interactions with specific touch points.	<ul style="list-style-type: none">• Physical props at 1:1 scale
Investigating how many systems play together across time and contexts.	<ul style="list-style-type: none">• Storyboards• Media from the future
Testing if an audience understands an idea and sees value in it.	<ul style="list-style-type: none">• Media from the future• Wizard of Oz• Video prototypes
Describing and sharing an idea easily.	<ul style="list-style-type: none">• Props based / Wizard of Oz demonstration• Video prototypes
Documenting the vision for a product to set the goal.	<ul style="list-style-type: none">• Media from the future• Video prototypes
Informing technology requirements and decision making.	<ul style="list-style-type: none">• Breaking down Wizard of Oz, Videos or Storyboards into key moments that require particular technology.

Further reading

- Designing Connected Products (esp. Chapter 14)
- Sketching User Experiences - Bill Buxton
- Pretotype It - Alberto Savoia (Free ebook)
- About Face 3 - Alan Cooper

Thank you.

Martin Charlier

@marcharlier

m@marcharlier.com