Because technology should work for everyone
Today, tomorrow, the future

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A presentation in three parts

- An emerging problem – of our own making
- An effort toward making today's computers usable by more people who currently can't
- The need to rethink accessibility in the future
  - including a Grand Challenge

We have an emerging crisis

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- and it is of our own making

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– While technology is enabling independence, employment, and participation for some….

We have an emerging crisis

- and it is of our own making

- While technology is enabling independence, employment, and participation for some….
- It is creating barriers for others

People used to be able to

- get an education,
- be employed, and
- live independently…
  - **without needing to understand and use technology**

People used to be able to

- get an education,
- be employed, and
- live independently…
  - **<u>without</u> needing to understand and use technology**

- **Not anymore**

We are creating a society that **requires the ability to understand and use technologies**.

But - we are not designing technologies that are understandable by all, much less usable by all.

- We have made progress
  - Special interfaces
  - Inclusive design features built into our products…

- But these are largely for individuals **with higher levels of technical ability.**

TQ

TQ ≠ IQ

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I know people who are blazingly smarter than I am, who can't use their technologies.

TQ ≠ IQ

I know people who are blazingly smarter than I am, who can't use their technologies.

But I can.

Even those of us here

– all of whom have way above average IQ and TQ, have trouble with our technologies.

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And if **we** have trouble ….

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- Or the bottom 20 %

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And if **we** have trouble ….

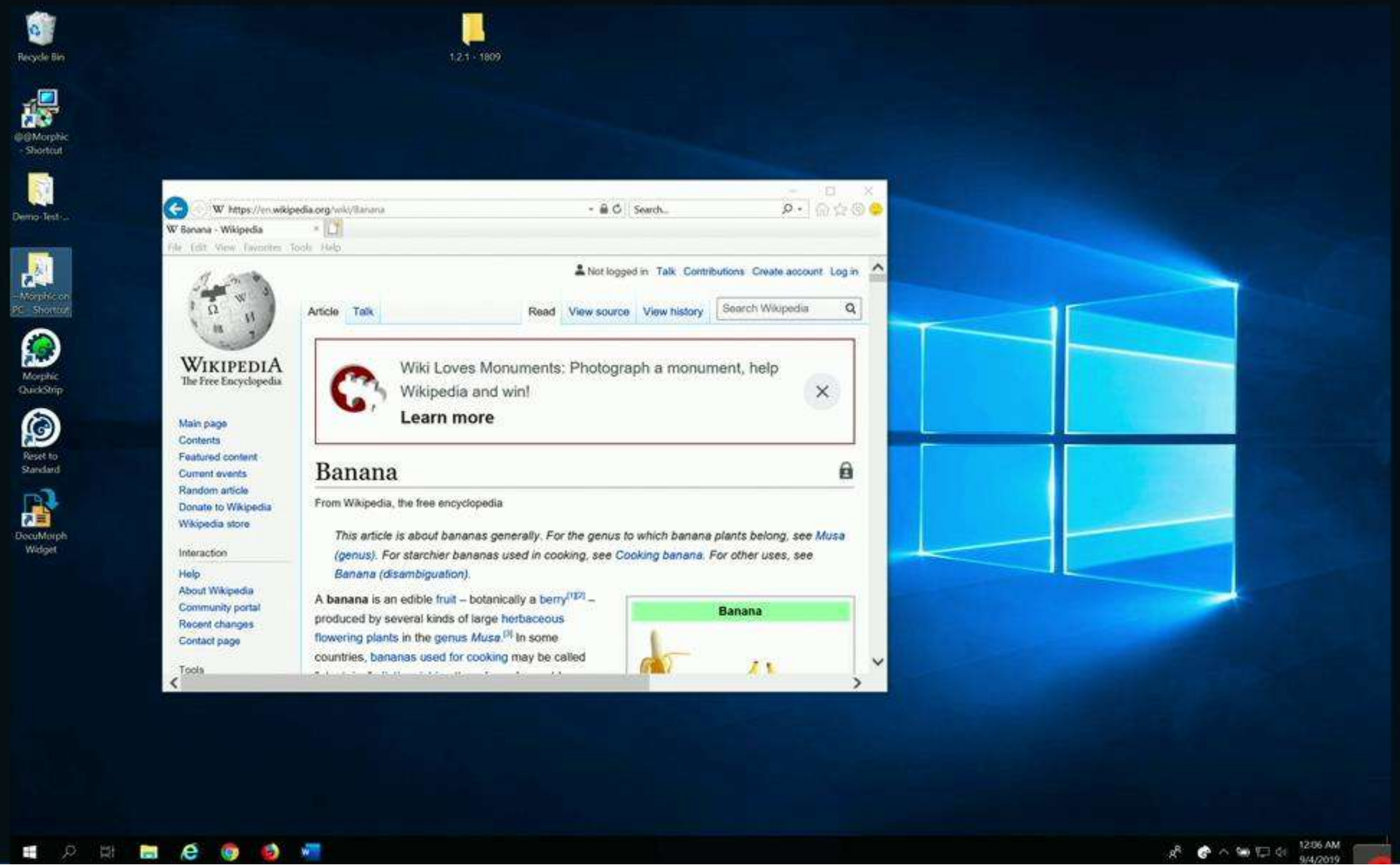
- What about the half who are below median
- Or the bottom 20 %
- Or the bottom 10 %

- Even when we create features to make things more accessible – they are buried in complexity.

For example

We have features that make…

Hard to Read Screens



Larger

Recycle Bin

1.2.1 - 1809

@@Morphic - Shortcut

Demo-Test-...

--Morphic on PC - Shortcut

Morphic QuickStrip

Reset to Standard

https://en.wikipedia.org/wiki/Banana

Search...

Banana - Wikipedia

File Edit View Favorites Tools Help

Current events
Random article
Donate to Wikipedia
Wikipedia store

Interaction

Help
About Wikipedia
Community portal
Recent changes
Contact page

Tools

What links here
Related changes
Upload file
Special pages
Permanent link
Page information
Wikidata item
Cite this page

Banana

From Wikipedia, the free encyclopedia

This article is about bananas generally. For the genus to which banana plants belong, see Musa (genus). For starchier bananas used in cooking, see Cooking banana. For other uses, see Banana (disambiguation).

A **banana** is an edible fruit – botanically a berry[1][2] – produced by several kinds of large herbaceous flowering plants in the genus *Musa*.[3] In some countries, bananas used for cooking may be called "plantains", distinguishing them from **dessert bananas**. The fruit is variable in size, color, and firmness, but is usually elongated and curved, with soft flesh rich in starch covered with a rind, which may be green, yellow, red, purple, or brown when ripe. The fruits grow in clusters hanging from the top of the plant. Almost all modern edible seedless (parthenocarp) bananas come from two wild

Banana

Peeled, whole, and longitudinal section

Scientific classification

Kingdom:	Plantae
(unranked):	Angiosperms
(unranked):	Monocots

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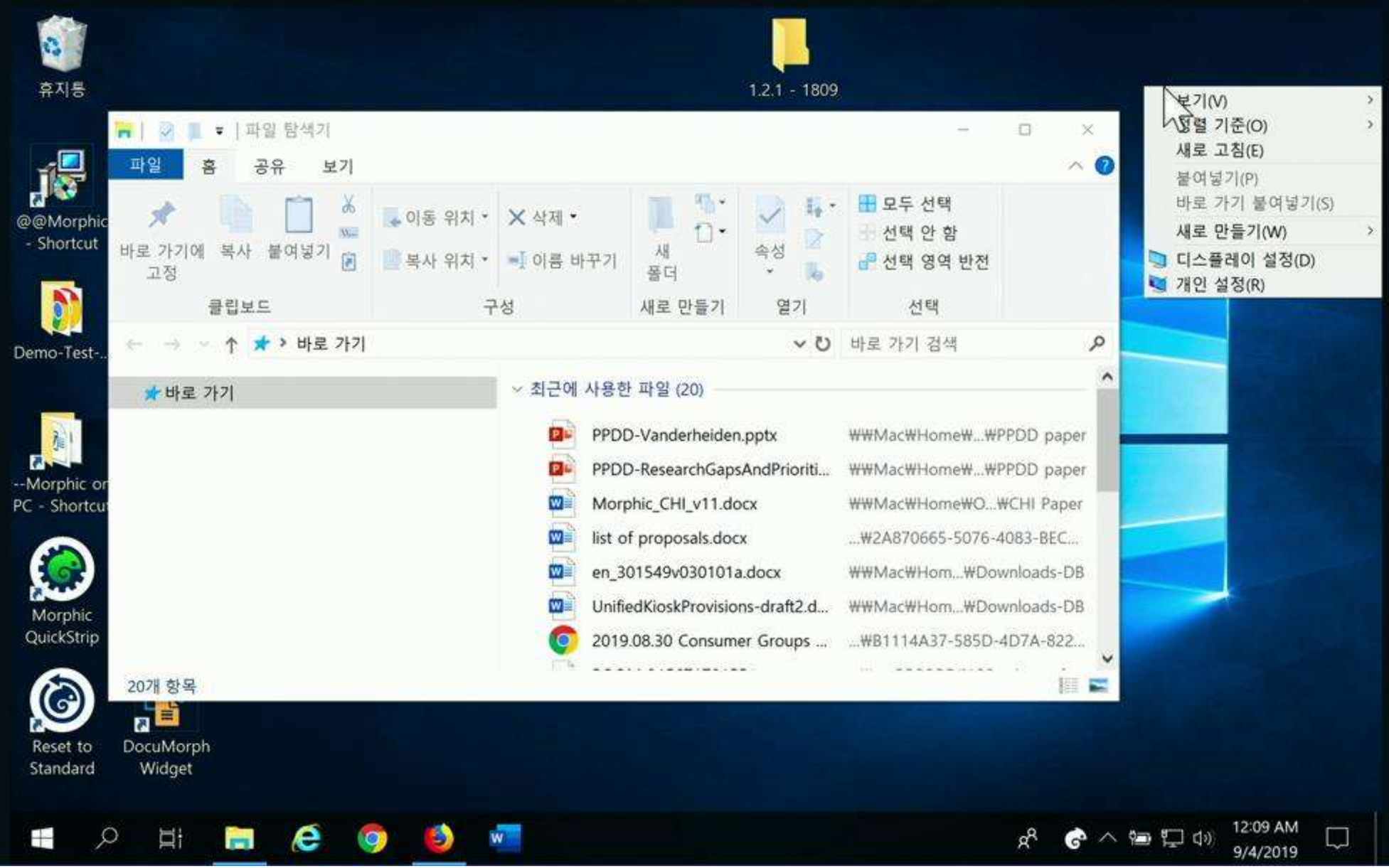
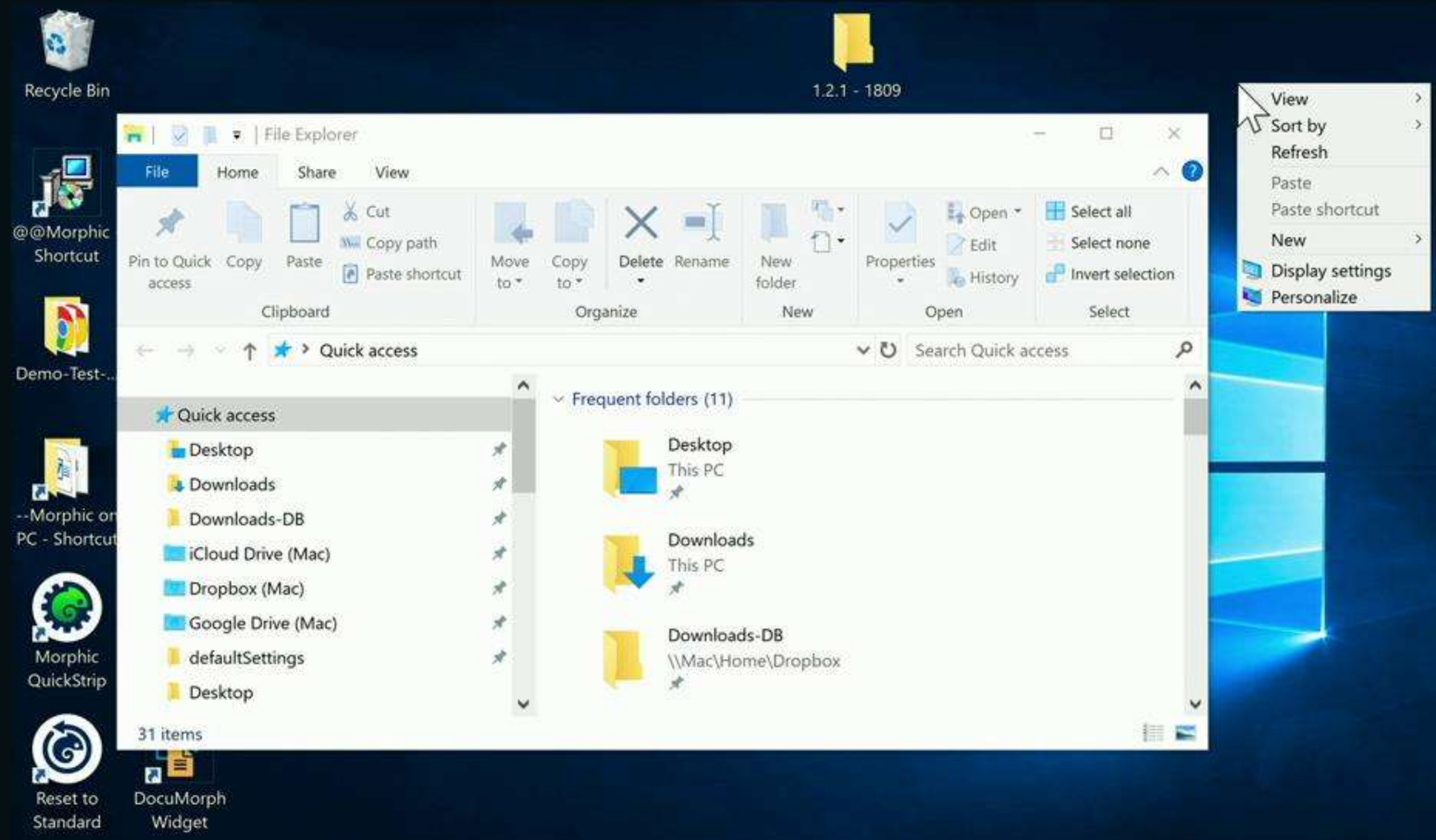
Computers in foreign language – change to ours




Recycle Bin
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@@Morphic Shortcut
Demo-Test-...
--Morphic or PC - Shortcut
Morphic QuickStrip
Reset to Standard
DocuMorph Widget
File Explorer
File
Home
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Paste shortcut
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Move to
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Rename
Organize
New folder
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iCloud Drive (Mac)
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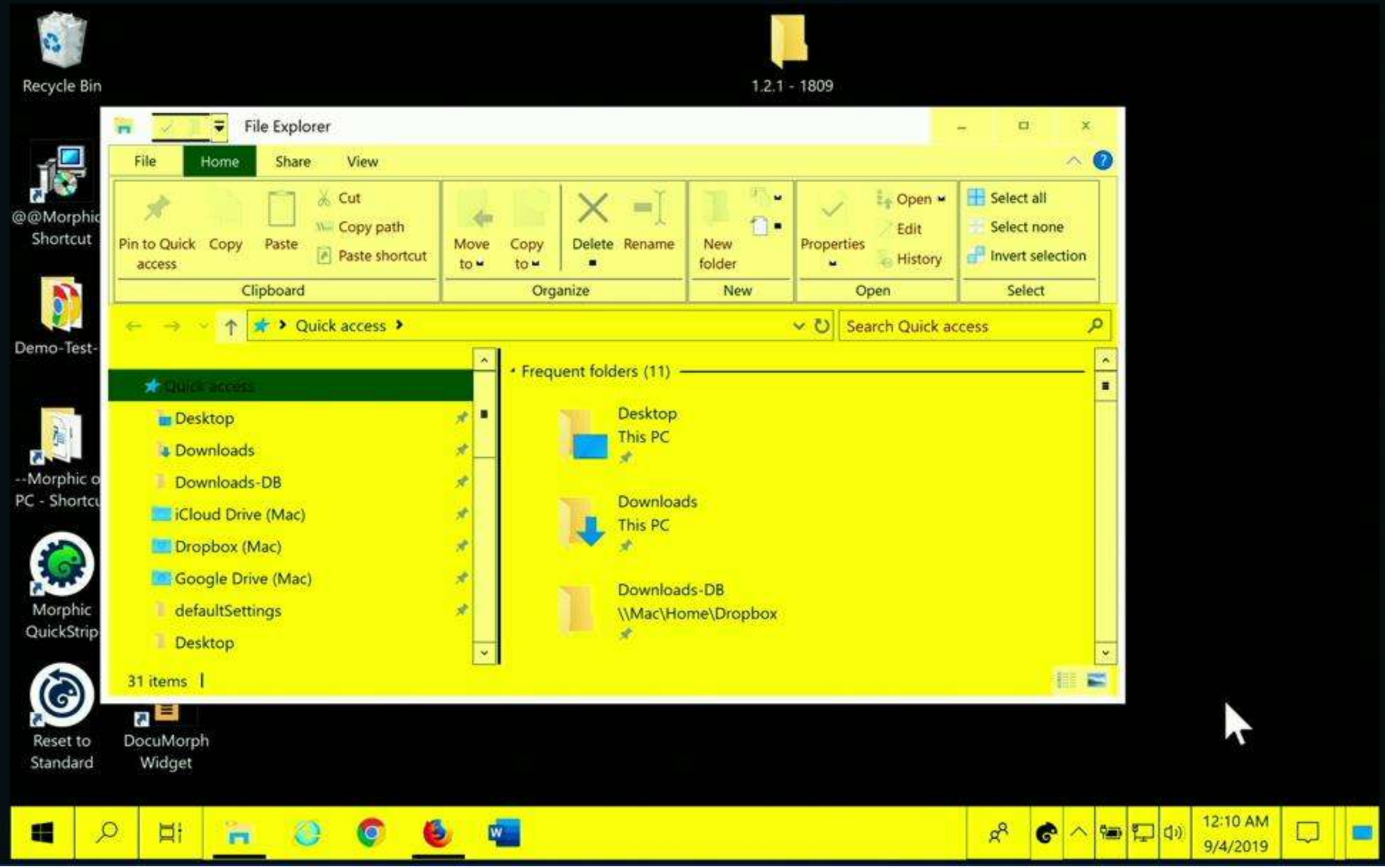
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Select none
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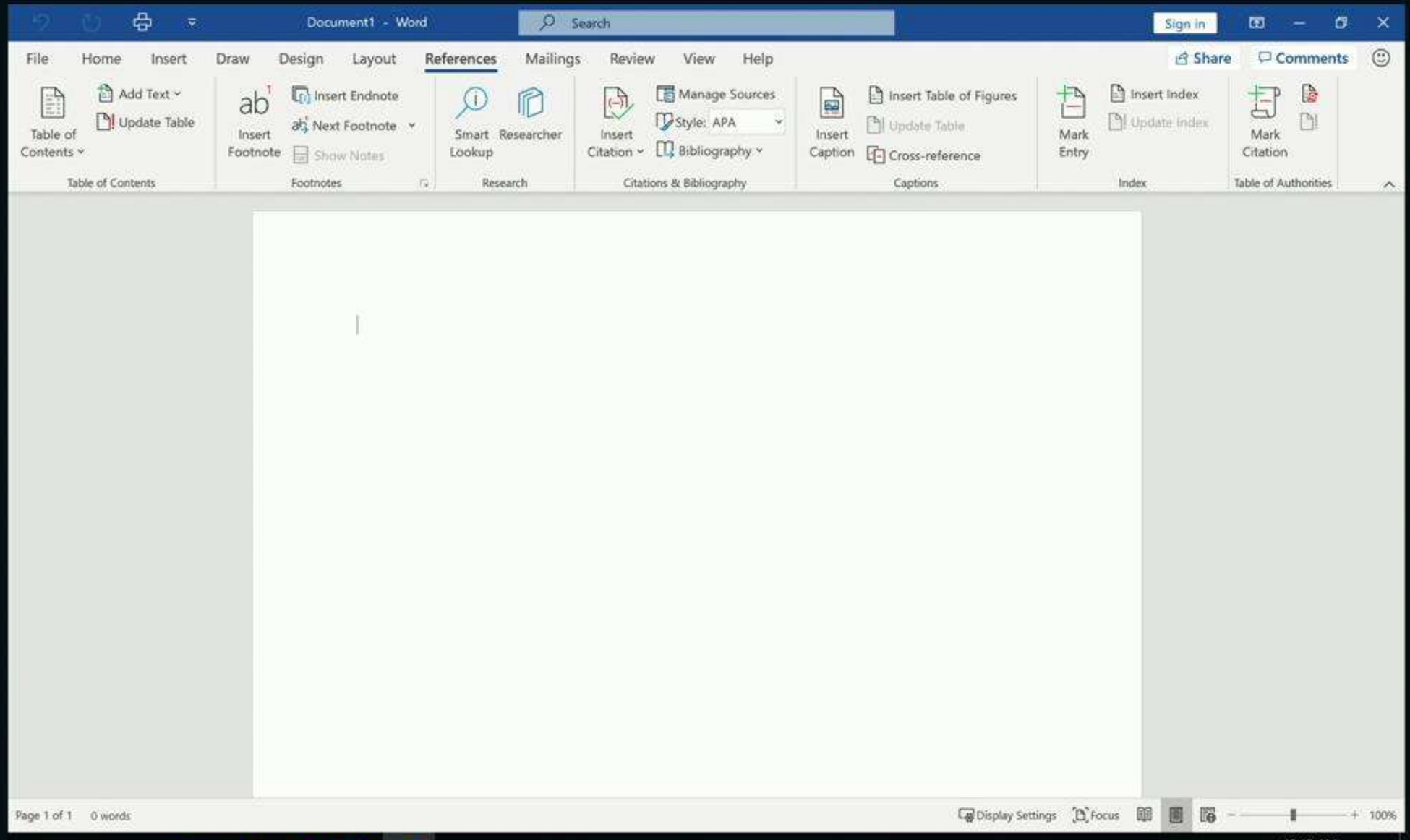
Document1 - Word
Search
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Add Text
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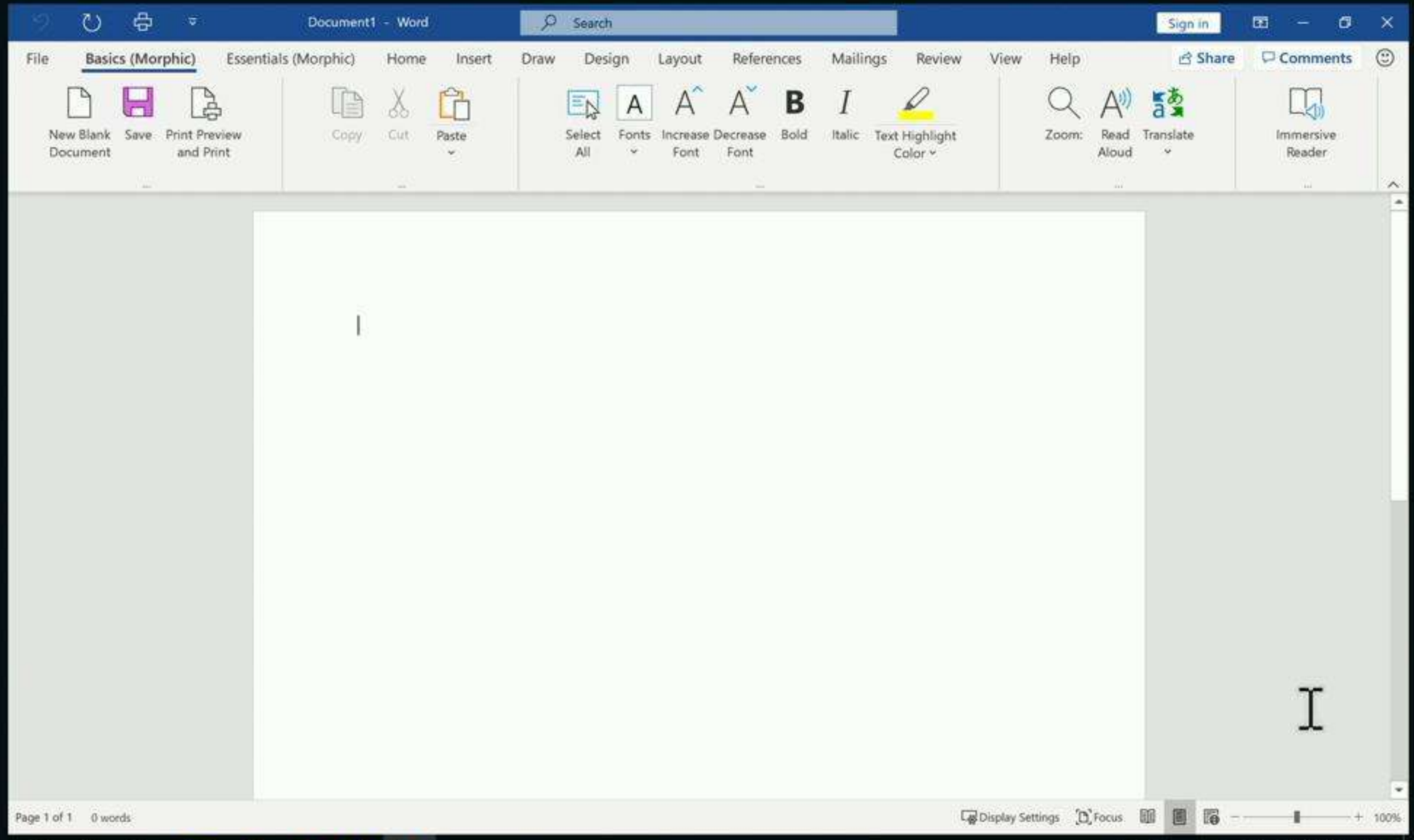
Document1 - Word
Search
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Basics (Morphic)
Essentials (Morphic)
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View
Help
Share
Comments
New Blank Document
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Translate
Immersive Reader
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- And even when shown how – it is often **so complicated** that most users **do not remember how** to do it for themselves.

But to use these features…

- You need to be **aware** of them -- and know where to find them buried in the complex hierarchical settings system.
- And even when shown how – it is often **so complicated** that most users **do not remember how** to do it for themselves.
- Also – the feature often **has to be turned on** in order for the user to be able to use the computer enough to turn it on.

We have been exploring this problem with a tool called Morphic


Recycle Bin
1.3.0 (1)
1809
MO
Morphic
QuickStrip
Reset to
Standard
Simple1.CMD
MOD.CMD
Full.CMD
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11/25/2019

So Morphic can

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1. **Expose features hidden in devices** -- so they are known and used by those who need them -- by using a layered approach that brings the tips to the surface with links to the rest.


Recycle Bin
1.3.0 (1) 1809
MO
Morphic QuickStrip
Reset to Standard
Simple1.CMD
MOD.CMD
Full.CMD
Morphic QuickStrip
My eMAIL
My Pictures
Screen Zoom
Screen Snip
Open & Eject USB
MORE... (& HELP)
Save
My Saved Settings
Undo
Reset to Standard
2:22 PM
11/25/2019

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NOT just for those we think of as having a disability

We are disabling people
with the complexity of what we design.

- And we don't recognize it
- We think it is them - a problem they have – and not a problem with what we are doing
- Nor do we realize how prevalent or serious it is.

Before I leave this part of my talk to talk about the future I leave you with a thought….

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  - **need to have High MQ (Math Quotient)**

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How many of us would be at a Job center
– feeling hopeless
– and feel like we can't make it if we tried.

So why are we creating a world where you can ‘t get along without a high TQ

So why are we creating a world where you can ‘t get along without a high TQ

... with an average one.

… or a low one.

We need to figure out how to design for all levels of TQ.

We need to figure out how to design for all levels of TQ.

- Layering complexity
- Providing easier entry
- And more….

Or we are going to simply exclude people from our future world.

- not just employment
- and more people than we realize,

Doing better in the future – by doing it differently

AI Grand Challenge

Universal Accessibility via Info- Bot and Individual User Interfaces Generators

The Problem – 4 parts

1. In today's society, it is no longer possible to live, learn, participate or be employed unless you can use digital interfaces

The Problem – 4 parts

2. Only a small percentage (~6%) of products and websites are accessible

The Problem – 4 parts

3. It is impossible to train all developers in major companies to create interfaces accessible by all.

The Problem – 4 parts

3. It is impossible to train all developers in major companies to create interfaces accessible by all.
   - **And most products are from small companies who have even less ability to do so**
   - **Even accessibility leaders are unable to do so. Almost none are expert in all disabilities.**

The Problem – 4 parts

4. It is not possible to create interfaces, even flexible ones, that will meet the needs of all users.
   - **Especially all types and levels of cognitive disability.**

Proposition

- Instead of trying to make all products accessible to all users
- Just make them generally usable.
  - **i.e. Understandable and Usable by at least the most able 50% of the population.**

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- Then **create an AI robot (an Info-Bot)** that is powerful enough to **understand and use any interface that 50% of the population can use.**
  - **The info-bot would be open source and available free.**
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- Accessibility experts - in companies, universities and other non-profit and for profit organizations – would **create interface generators tailored for each different type and combination of disability.**

Benefits

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    - And asks them to address all types and levels and combinations of disability – or else leaves some people behind.

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Benefits cont'd

- Interface generators could be developed for different groups that are tailored specifically for that group.
  - **For example, an interface for people who are blind could be designed to be the way an interface would be organized and designed if no-one had sight (rather than one designing to present a visual interface non-visually).**

Benefits cont'd

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- All products would be accessible (as long as they were usable by Info-Bot)

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- The Info-Bot will continue to gain power, ever reducing the difficulty in making things work with it.

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- We don't *yet* have the ability to do this – but we could in near future with reasonable effort.
- It would require a new contract with industry on accessibility – but it should be much easier to do than what we have today.
- And the scope of the types of people with disabilities that could be addressed would be limited only by the knowledge and ingenuity of our disability and design teams – rather than product constraints

The Grand Challenge.

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- **Create an AI robot (an Info-Bot) that is powerful enough to understand and use an interface that 50% of the population can use.**
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- **Create Individual User-Interface Generators (IUIGs)**
  - **That would provide each type of user with interfaces for products that match their abilities**
  - **An interface like what would be provided on a product if everyone were like them.**
- **Create a new accessibility Contract between industry and society**

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  - An interface like what would be provided on a product if everyone were like them.
- **Create a new accessibility Contract between industry and society**
  - Instead of trying to make products interfaces usable by all users,
  - Companies would only have to create interfaces that the (ever increasingly capable) Info-bot can use
  - And they could focus instead on working with consumers, academics, etc. to figure out how to create better individually-focused interfaces for each and every different type, degree and combination of disability (and literacy, and digital literacy etc.)

- Ambitious yes – but the only way to address the problems

1. **We need to be able to reach everyone - with every combination of ability**

2. **We can ‘t reach / teach everyone who is making interfaces**

3. **Our current approach only reaches 6% of interfaces**
   (and not even usable everyone even on those)

4. **We can’t put interfaces for everyone (every combination) on all products.**

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The opinions herein are those of the author and not necessarily those of the funding agencies.