

# **Alex Livingston**

**Product and Experience Design** 



# **Improving Excel Online**

**Presented here:** 

**Data Validation redesign** 

**Other work:** 

Sort & Filter redesign MS Forms & Excel integration Cut Copy Paste animations Excel start page redesign



# **Data Validation**

# Controlling and checking spreadsheet inputs to avoid mistakes



### Bringing Excel on the web to the forefront

Contextual issues:

**People don't know Excel is on web** – Lack of awareness for existing & potential users

**Confusion about Office** – Perpetual license VS O365 paid VS free web version

**Google Sheets competition conundrum** – Catch up or innovate?

\*\*\* Excel Online feature holes – port over from desktop, or improve?







The design mission

report card

Business goal:

Bring the Data Validation feature to Excel Online for parity with desktop





Port it over with its current functionality and **a visual redesign** 



Opportunity to **redesign its functionality** and interface



Data Validation

# One of the most used features in Excel

### Generally

Data validation is a feature used to control what a user can enter into a cell

It's about limiting or checking the accuracy and quality of data

1. DV users care about control "will my data will be safe from human error?"

### Therefore:

2. Any lack of clarity around creating a rule or its effect is a failure of the feature and its design

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Data Validation

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### First, a **thorough audit** of the feature today

I did a super-thorough audit of the UI today, for experience, effort, affordance, comprehension, heuristics, visual design, and brand.

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### Building a case for redesign

# Scrappy research - Data Validation didn't work as people thought it did... or should

I did quick interviews with colleagues at Microsoft, both with and without Excel experience.

Then I conducted a remote study with "frequent Excel users", proficient using functions like Data Validation.

Most participants noted several things about the feature that they thought:

- Were feature bugs
- Didn't behave as wanted or expected
- Had a function they didn't know about

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User Testing

Data Validation

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### UX values to re-introduce (and improve) the legacy feature

Simplicity of design

Removal of cognitive noise

Human language

Consolidation of mental modals

Clarity of predictable effects

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### Better communication with a remote team

To bolster the buy-in from leadership, gain great cooperation of PM and ENG on the team, and design together with more clarity and speed, I lobbied to spend time with the web Excel core team in Tel Aviv, Israel.

I was able to get a sense of their working style &culture, gain trust on my design process and decisions, and leave with a sense moving forward how best to refine products together.









# **Tweaks and twinkles**

Small, motivated improvements that can make for better UX



# First open

Overall - update visual style, spacing, font and sizing, border and drop shadow to align with brand

Nix redundancy	Data Validation           Settings         Input Message         Error Alert	? ×	Simplify tabs to two (i.e. <i>cause &amp; effect</i> ) Human	Data Valida Criteria №	tion <sup>1essages</sup>	×	
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Dialogue makeover

# Creating a validation rule

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Apply these changes to all other cells with the same settings      Clear All      OK      Cancel      Desktop		Clear All	Ignore blank OK Cancel OK Veb	- Resurface valid options



Dialogue makeover

### Hints... like validation for validation

Trying to commit an invalid rule [ hits "OK" ]

Data Validation ? ×	Data Vali <sup>Criteria</sup>	dation Messages	×		Data Vali <sub>Criteria</sub>	dation Messages	×
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Desktop

During rule creation



# A complete rule

ata Validation	? ×		Data Valic <sub>Criteria</sub>	lation Messages	×
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Desktop				Web	

Dialogue makeover

X∄

## A seamless, dedicated teaching hint

A       B       C         1       cat       •         2       dog       cat         3       bird       dog         5       bird       -         6       -       -         7       -       -         =A1:A3       E	Data Validation ? ×     Settings Input Message   Validation criteria   Allow:   List   Data:   Data:   Data:   Source:   I	Criteria     Messages       Allow     List       Source *     Type or select       Hint text     Select from a range, or enter items seperated by commas (example "cat,dog,bird").       In-cell dropdown       Ignore blank
=cat, dog, bird 🖽	Apply these changes to all other cells with the same settings       Clear All       OK       Cancel	Clear All OK Cancel
<b>Two of the ways</b> to create a Dropdown List rule	Many users <b>do <i>not</i> know there are multiple</b> <b>ways</b> create a List rule, and there is no UI hinting that it accepts items direction into the field	Small dedicated teaching text <b>informs</b> <b>more users on ways to use the feature,</b> helping casually demystify Excel
	Desktop	Web



# Low hanging A.I.

How can we leverage info users already input to make their task easier?



### Whole number

With a ranging containing **whole numbers - criteria and** values are filled from data in the range using the highest and lowest numbers as max and min limits.

Those numbers are color highlighted in the range to easily show the user the source and logic.

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### Decimal

With a ranging containing **only numbers with any decimals, criteria and values are filled from range data**, allowing any decimal and again using the highest and lowest numbers limits.

Again, the max and min are highlighted in the range for the user to see the source.

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### Intelligent nudges

# Smart help to get started

### Today

Filling out criteria and creating DV rules is <mark>completely</mark> manual.

### Next

Excel detects data from the selected range, and upon opening Data Validation, criteria are pre-selected and populated based on range data.

This benefits most users out-of-the-box, and also adds a seamless teaching element that shows how they can use it it later.

### List

With a range containing **only text strings - List criteria is pre-chosen and values filled from text in the range**. The user can edit or overwrite as they wish.

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# OK, so what *can* type in there?

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Intelligent messages

Problem today: Extra effort

### Today

Rule error messages default to generalized text that offer no hint as to what limits the cell has on it.

Users must manually customize error messages to offer direction on what can be input into the cell.

	Data Validation		?	×
	Settings Input Mess	age Error Alert		
	✓ Show error alert aft	er invalid data is entered		
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Intelligent messages

# Solution: Reduce (effort) and reuse (inputs)





# What we shipped

[ try it in Excel at Office.com ]



I left Microsoft as features like Data Validation were being built in Excel online. Without being there to oversee implementation the released version differs in various ways.

### Overall, the much of the intended design and direction made it into the new build.

The differences are a great reminder of the cohesion, communication, and followthrough needed by the whole team to retain the integrity of the design, even as resources and timelines change.

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Reset



Creating a new rule on an existing data range now flags outliers with no extra steps taken

The error message UI is coupled into the cell/formula error flag on the upper left

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Just plain easier comprehension for all users

A smooth, UX focused experience means **new DV users** will use it (love it) more

A modern visual look shows that Microsoft is continuing to update with the times

Functionality hints that act as in app teaching enables Excel users more power to get things done

All of this funnels into retaining Excel loyalists and gaining/retaining new users, bolstering Office's business value

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Apply these changes to all other cells with the same setting	15
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alexanderlivingston.com

thelivingston@gmail.com

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2	PaperAll Total Asset Sizes	21,955	
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# **X** If I were to design the next thing...

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# **X** If I were to design the next thing...

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# The problem

### Cleaning data is painful and prone to error

Even as part of the toolkit of Information Workers, getting and cleaning data is a chore and source of mistakes

28 Е G н L. David Smith, Jr. Head of Marketing East Lake Branch West Palm Beach Florida Jack Lambert President and CEO Mountain Brook Branch Los Angeles California Beverly Johnson MacBride Branch Manager 5th Avenue Branch Hollywood California Charlotte Elaine Cantrell Carter Manager Seaside Branch Destin Florida Robert Lewis Stevenson Director of Internal Affairs Diamond Peak Branch North Lake Betsy Garner Director of Public Relations Intermountain Branch Park City Utah Benjamin Burke COO of Operations North Cove Branch San Diego California Nathaniel P. Andrews Branch Manager Lake Shore Branch Boston Massachusetts Michael J Alexander, Jr. President and CEO Fisherman's Wharf Branch San Francisco William Wallace III Marketing and Advertising Manager North Pacific Coast Branch 5 C.J. "Corky" Martinelli, PhD CFO Business and Finance Arbour Lake Branch Calgary All

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Interview ]



### New Data Types

### Mental model: A row of delineated information

The most common structure in Excel of an entity, object, or thing, is a row of information, usually with a title identifier and subsequent data in columns

B. & O. RAILROAD	Property name B & O Railroad	Status On market	Owner Kevin	Mortgage v \$	value 100	Rent \$	25	Rent (2 RR \$	R's) ∣ 50	Rent (3 RR's) \$  100	Rent (4 RR' \$ 20	) Category 0 Transportation	Similar Properties Pennsylvania Railroa
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New Data Types

### MVP generic layout







# MVP generic layout



### Portland

### Description

Portland is a seaport and the largest city in the U.S. state of Oregon and the seat of Multnomah County. It is in the...

### State

Oregon

Area (square km)

380

Population (2015)

632,309



### Portland

Description

Portland is a seaport and the largest city in the U.S. state of Oregon and the seat of Multnomah County. It is in the...

State

Oregon

Area (square km)

380

Population (2015)

632,309 Time Zone (UTC)

8

County

Multnomah County

Contained By United States of America

Leader **Ted Wheeler** 

Title

Mayor

Latitude (N)

45:31:12

Longitude (W) 122:40:55



New Data Types

### Integration with current Excel features

### Considerations

User comprehension City Cell placement III Seattle Difference Portland Color III Vancouver Readability & noise III San Francisco III Los Angeles Discoverability III San Bernadino Interaction 🕮 San Diego 🕮 Oakland III Sacramento

# #DIV/0!ErrorsContosoComments3.99Alignment1033Cell formatting444ContosoLongnamingsTruncation

Cell decorations

### New Data Types X∎

### IXD sketch: Show more, show less

### 😣 C6

Ecuadorian supersweet dessert banana

### About

The banana is an edible fruit – botanically a berry – produced by several kinds of large herbaceous flowering plants in the genus +

Energy (kilocalories)

89

Carbohydrate (grams)

22.84

Sugar (grams)

12.23

Lipid (grams)

.33

### 😣 C6

-17



### About

The banana is an edible fruit – botanically a berry – produced by several kinds of large herbaceous flowering plants in the genus Musa. In some countries, bananas used for cooking may be called plantains, in contrast to 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 parthenocarpic bananas come from two wild species – Musa acuminata and Musa balbisiana. The scientific names of most cultivated bananas are Musa acuminata, Musa balbisiana, and Musa paradisiaca for the hybrid Musa acuminata M. balbisiana. depending on their genomic constitution



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2	19	558	Apple	\$15.00	\$290.00	Juniper berry	Pomegranate	
3	11	435	<> Apricot	\$13.00	\$65.00	Kiwi	Pomelo	
4	1	160	Avocado	\$7.00	\$167.00	Kumquat	Purple mangosteer	1
5	12	119	Banana	\$13.00	\$164.00	Lemon	Quince	
5	5	305	Bilberry	\$6.00	\$248.00	Lime	Raspberry	
7	19	426	Blackberry	\$19.00	\$206.00	Loquat	Salmonberry	
3	15	387	<> Blackcurrant	\$7.00	\$232.00	Longan	Rambutan	
1	10	480	<> Blueberry	\$15.00	\$312.00	Lychee	Redcurrant	
0	10	289	Boysenberry	\$13.00	\$135.00	Mango	Salal berry	
1	20	416	<> Currant	\$5.00	\$159.00	Marionberry	Salak	
2	18	331	Cherry	\$10.00	\$135.00	Melon	Satsuma	
3	7	516	<> Cherimoya	\$6.00	\$232.00	Cantaloupe	Star fruit	
4	2	177	Cloudberry	\$5.00	\$190.00	Honeydew	Solanum quitoense	2
5	12	641	⇔ Coconut	\$8.00	\$245.00	Watermelon	Strawberry	
6	17	219	Cranberry	\$6.00	\$161.00	Miracle fruit	Tamarillo	
7	19	600	Cucumber	\$5.00	\$83.00	Mulberry	Tamarind	
8	14	384	Custard apple	\$7.00	\$63.00	Nectarine	Ugli fruit	
9	14	208	Damson	\$9.00	\$150.00	Nance	Yuzu	
0	19	545	<> Date	\$9.00	\$158.00	Olive	Tamarillo	
1	19	680	Dragonfruit	\$19.00	\$111.00	Orange	Marionberry	
2	12	442	<> Durian	\$10.00	\$79.00	Blood orange	Melon	
3	10	628	Elderberry	\$7.00	\$258.00	Clementine	Cantaloupe	
4	15	440	Feijoa	\$17.00	\$75.00	Mandarine	Honeydew	
5	3	673	∽ Fig	\$14.00	\$249.00	Tangerine	Watermelon	
6	19	654	Goji berry	\$8.00	\$103.00	Papaya	Miracle fruit	
7	12	198	Gooseberry	\$7.00	\$275.00	Passionfruit	Mulberry	
8	4	223	∽ Grape	\$19.00	\$104.00	Peach	Nectarine	
9	2	438	Raisin	\$7.00	\$137.00	Pear	Nance	
0	9	149	◇ Grapefruit	\$5.00	\$67.00	Persimmon	Olive	
1	12	294	Guava	\$8.00	\$153.00	Physalis	Orange	
2	11	675	Honeyberry	\$4.00	\$309.00	Plantain	Blood orange	
3	12	297	Huckleberry	\$10.00	\$306.00	Plum	Redcurrant	
4	10	139	Jabuticaba	\$5.00	\$212.00	Prune (dried plum)	Salal berry	
5	3	433	<>> Jackfruit	\$18.00	\$314.00	Pineapple	Salak	
6	7	191		\$19.00	\$293.00	Plumcot (or Pluot)	Satsuma	

### Grid-to-card transition animation

Showing users a grid-to-card animation to ensure they understand the representation of the same data

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oan counselors and officers	80	89	9	1
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udget analysts	77	103	25	1.3
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ndustrial engineers, except safe	80	89	9	1.
Aechanical engineers	55	47	-8	0.6
	Decupation Title Construction managers Vining and related managers Communication, transportation, cood service and lodging manag Government chief executives an- Government analysts Control of the secutives and additors Budget analysts Un other financial specialists Wholesale and retail buyers, exc Purchasing agents, except whole Claims takers, unemployment be imployment interviewers, priva' furman resources, training, and I Cost estimators Conspectors and compliance office fax examiners, collectors, and refax examiners, collectors, and refax examiners, collectors, and refax examiners, including mini- Divid ther management support w Vining engineers Il other engineers Il other engineers Il cetrical and electronics engine Computer engineers Industrial engine	Decupation Title         1993           Construction managers         44           Mining and related managers         80           Communication, transportation, 55         80           Conservice and lodging manages         80           Sovernment chief executives an         80           General managers and administ         44           Fordessional, Paraprofessional, 1         80           Insurance underwriters         55           Credit analysts         44           coar preparers         56           Cuccountants and auditors         27           Budget analysts         77           No ther financial specialists         17           Wholesale and retail buyers, exc         51           Purchasing agents, except whole         80           Claims takers, unemployment be         55           Gonstruction and building inspect         80           Cost estimators         55           Gar engineers, and compliance office         55           Sout estimators         55           Management analysts         44           Construction and building inspect         80           Souts estimators         55           Gara examiners, collectors, and re         44	Decupation Title19932003ChaConstruction managers4450Construction managers6089Communication, transportation,5547Good service and lodging manag4450Goovernment chief executives an8089General managers and top exect5547Vil other managers and top exect5547Nil other managers and top exect5547Sovernment chief executives an8089General managers and top exect5547Ordit analysts4450Sovernment sand auditors2730Gauget analysts77103Sudget analysts77103Wi other financial specialists1714Wholesale and retail buyers, exc5129Purchasing agents, except whole8089Claims takers, unemployment be5547Cost estimators5547Construction and building inspect8089Nanagement analysts4450Subsessors8089Nil other management support v5547Avanagement singer6089Nil other management support v5547Avanagement singer8089Nil other management support v5547Avanagement singer8089Vil other management support v5547Avanagement singer8089Vil other	Decupation Title19932003ChangeRatConstruction managers60899Communication, transportation,5547-8Construction and lodging manag44506Good service and lodging manag44506Goovernment chief executives an80899General managers and top exect5547-8Consurance underwriters5547-8Dredit analysts44506Credit analysts44506Credit analysts5547-8Credit analysts5547-8Credit analysts7710325Credit analysts7710325Studget analysts7710325Varchasing agents and buyers, exc5129-23Varchasing agents, except whole80899Claims takers, unemployment be5547-8Cost estimators5547-8Cost estimators5547-8Construction and building inspect80899Statescrist808999It other management support v5547-8Construction and building inspect80899Vining engineers, including minit44506Construction and electronics engine5547-8Construction and electronics engine5547

[video]



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	+ 🕸
Listing 4, Mandlik Rd, Colaba	•
<sup>Owner</sup> Charu Varkey	*
Type Residential	$\sim$
Bed/Bath <b>2 bed, 1 bath</b>	
<sub>Size</sub> 1780 sq ft	
Status Active	$\sim$
Leads <b>4</b>	<b>.</b>
	ק



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### Listing 4, Mandlik Rd, Colaba, Mumbai

	А	В	С	D
1				
2	Listing	Owner	Туре	Bed/B
3	4, Mandlik Rd, Colaba	[] Andrea Varkey	Residential	2,1
4	10, Adarsh Nagar, Pali Naka, Bandra West	[] Aadhya Bali	Commercial	0,1
5	90, Cuffe Parade	[]Lakshmi Yogi Properties	Residential	5,2
6	248, Karai Estate, Tardeo Road	[] Neel Din	Residential	0,1
7	ITC Maratha, Sahar Road, Sahar Andheri East	[] Kiara Savant	Residential	3,2
8	28 B, Sunrise Apartments, Lokhandwala Comple	[]Lakshmi Yogi Properties	Residential	6,2
9	Plot No. 604, Pinnacle House, P D Hinduja Juncti	[] Rehaan Prakash	Residential	5,2
10	Fatima ∨illa, Building No. 8, 29th Road	[]Ananya Sama	Residential	2,2
11	17, Adarsh Nagar, Pali Naka, Bandra West	[]Daksh Chakraborty	Residential	3,1



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