Community, Connection, and Collaboration: How Putting People First Advances Technological Innovation

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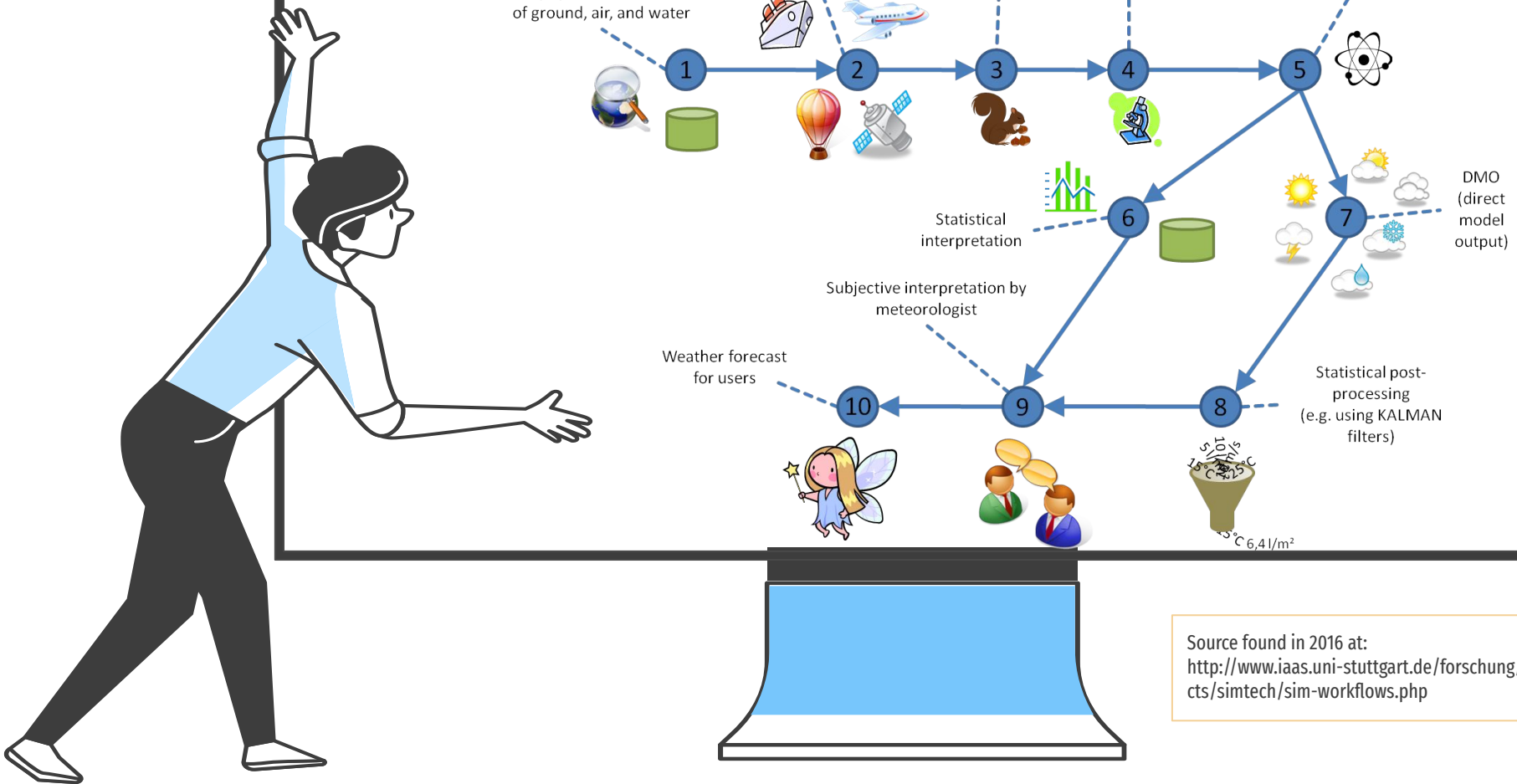
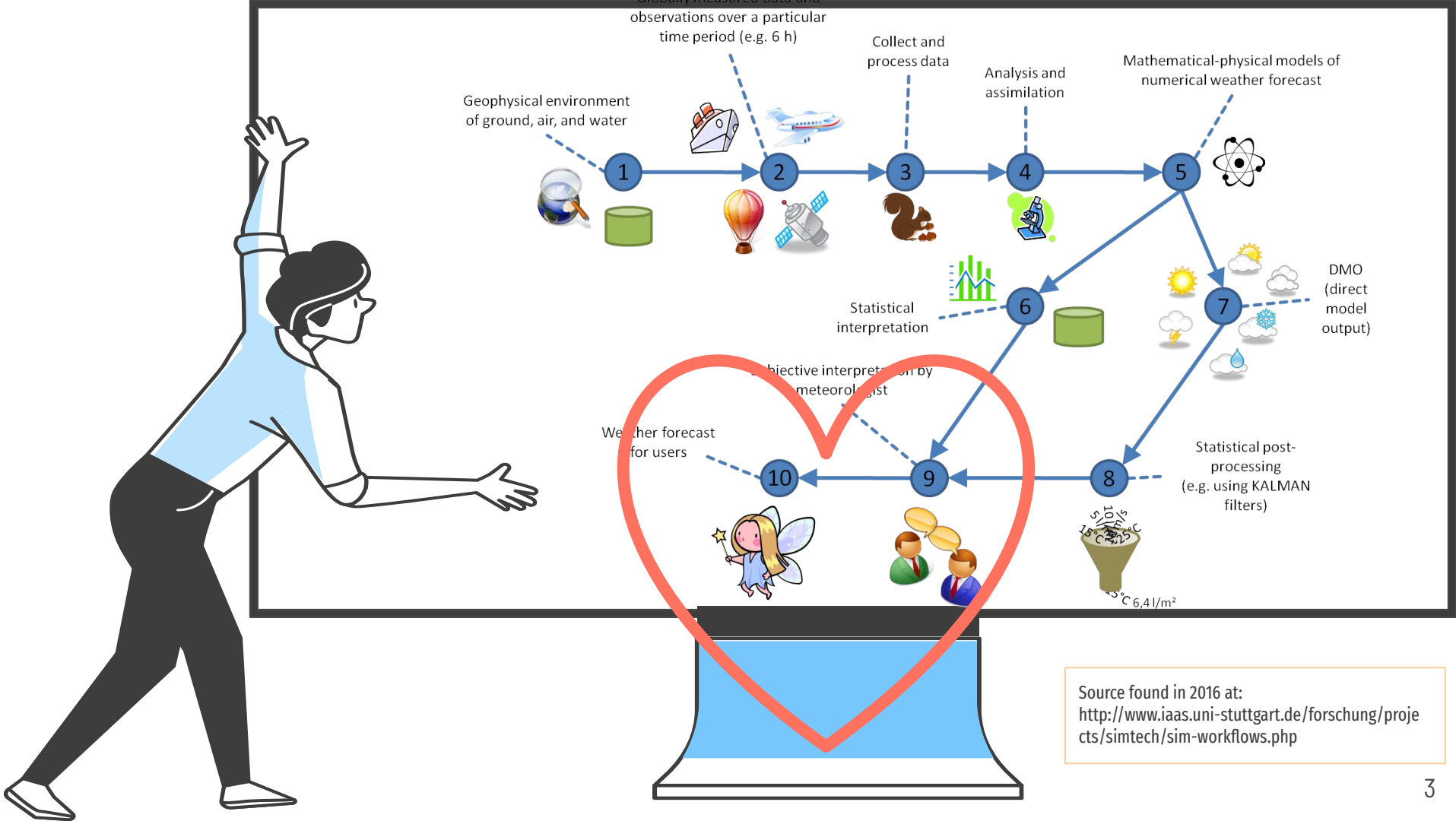


Source found in 2016 at:
http://www.iaas.uni-stuttgart.de/forschung/projects/simtech/sim-workflows.php



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Earth Prediction is sad without people. Technological Innovation requires people!

Goal 1

Show how community modeling needs BOTH the technical and social components

How?

Case study interviews with UFS/EPIC founders

We'll help turn that frown upside down!

Goal 2

Show how social science research applications can help guide where modeling improvements are needed the most.

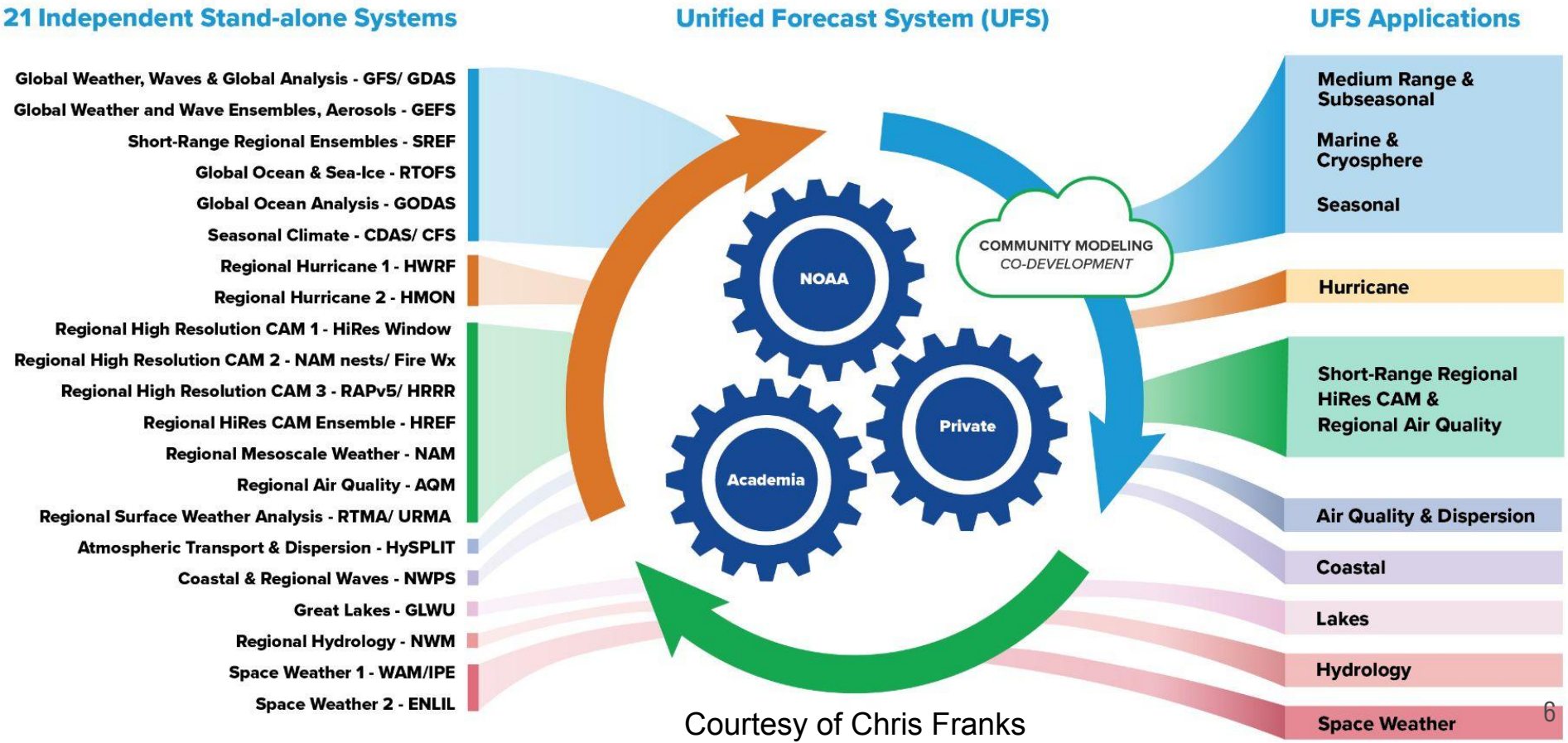
How?

Provide examples of social science results and how they need YOUR innovations to meet user needs


Why?

Simplifying NOAA's Operational Forecast Suite

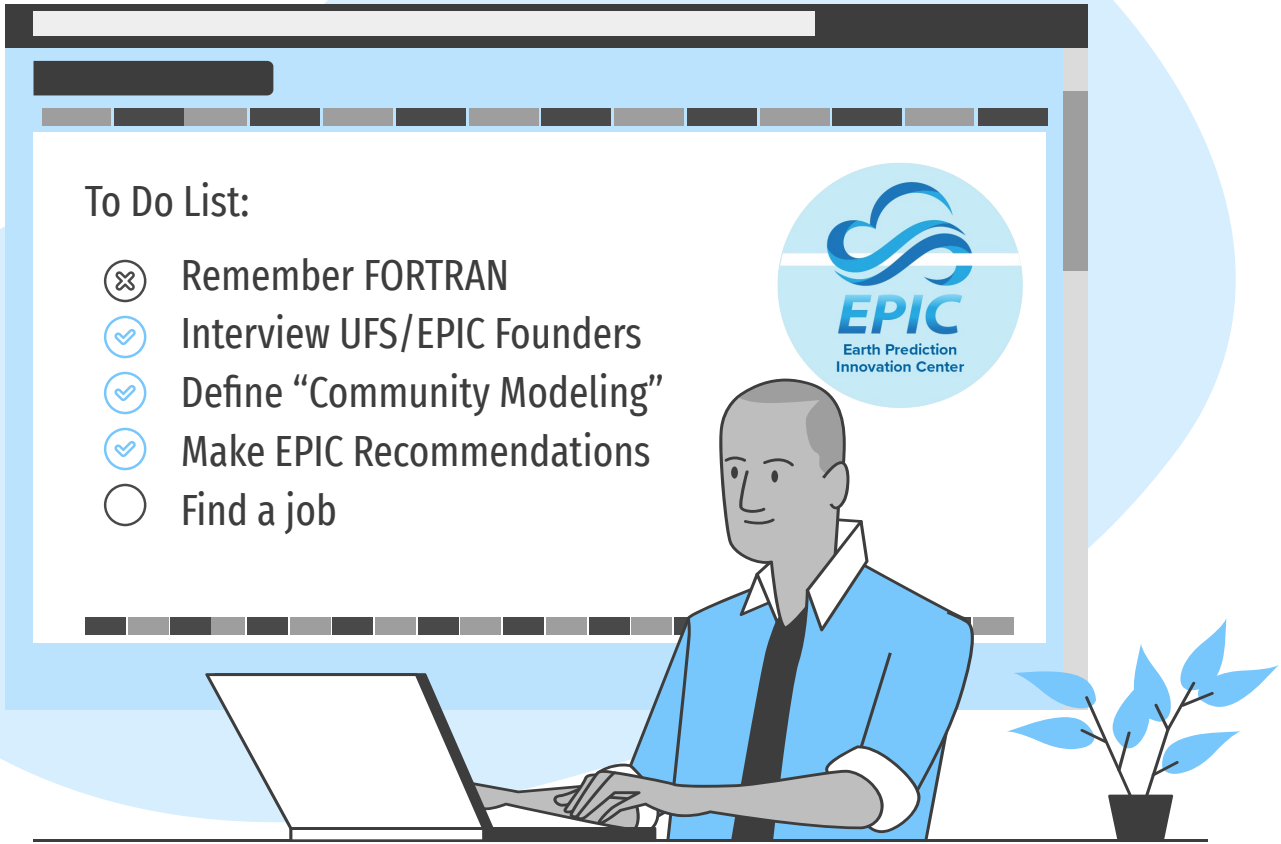
Reducing the 21 Stand-alone Operational Forecast Systems into Eight Applications



Courtesy of Chris Franks

What is Community Modeling?

William Lapenta Intern



What is Community Modeling?

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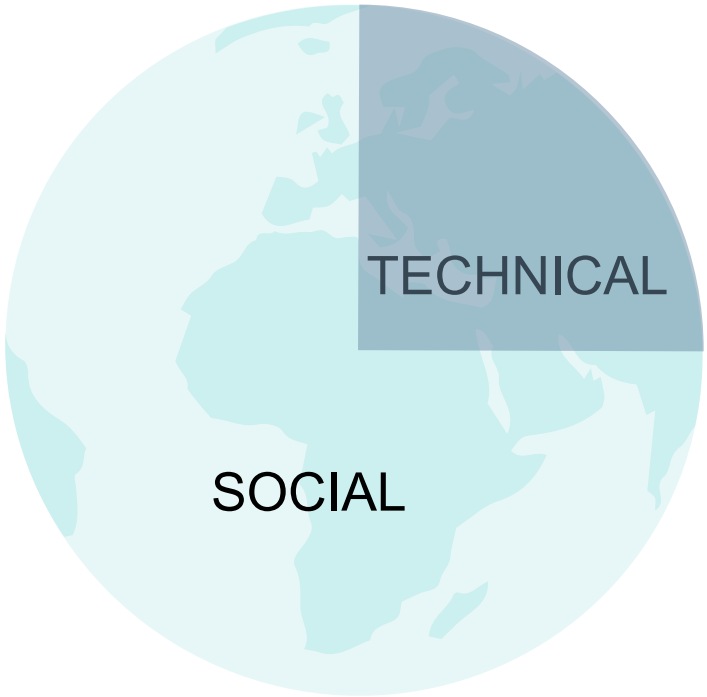

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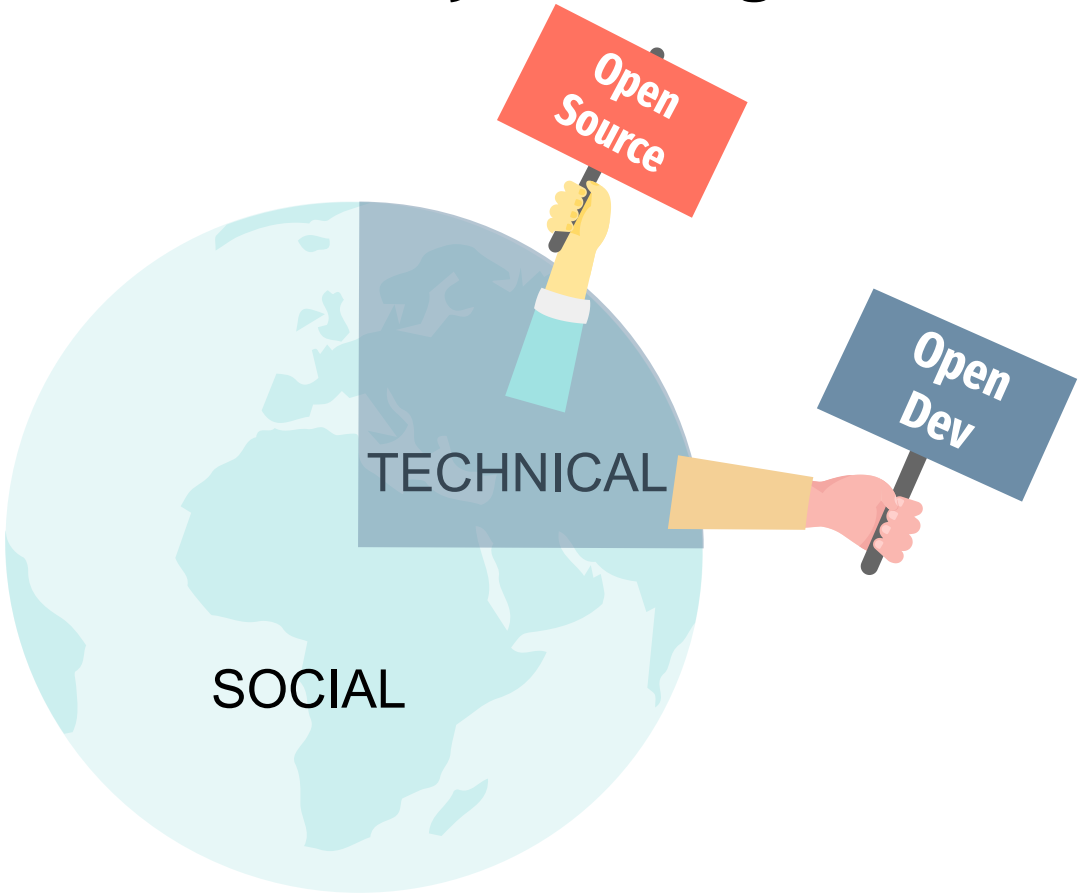

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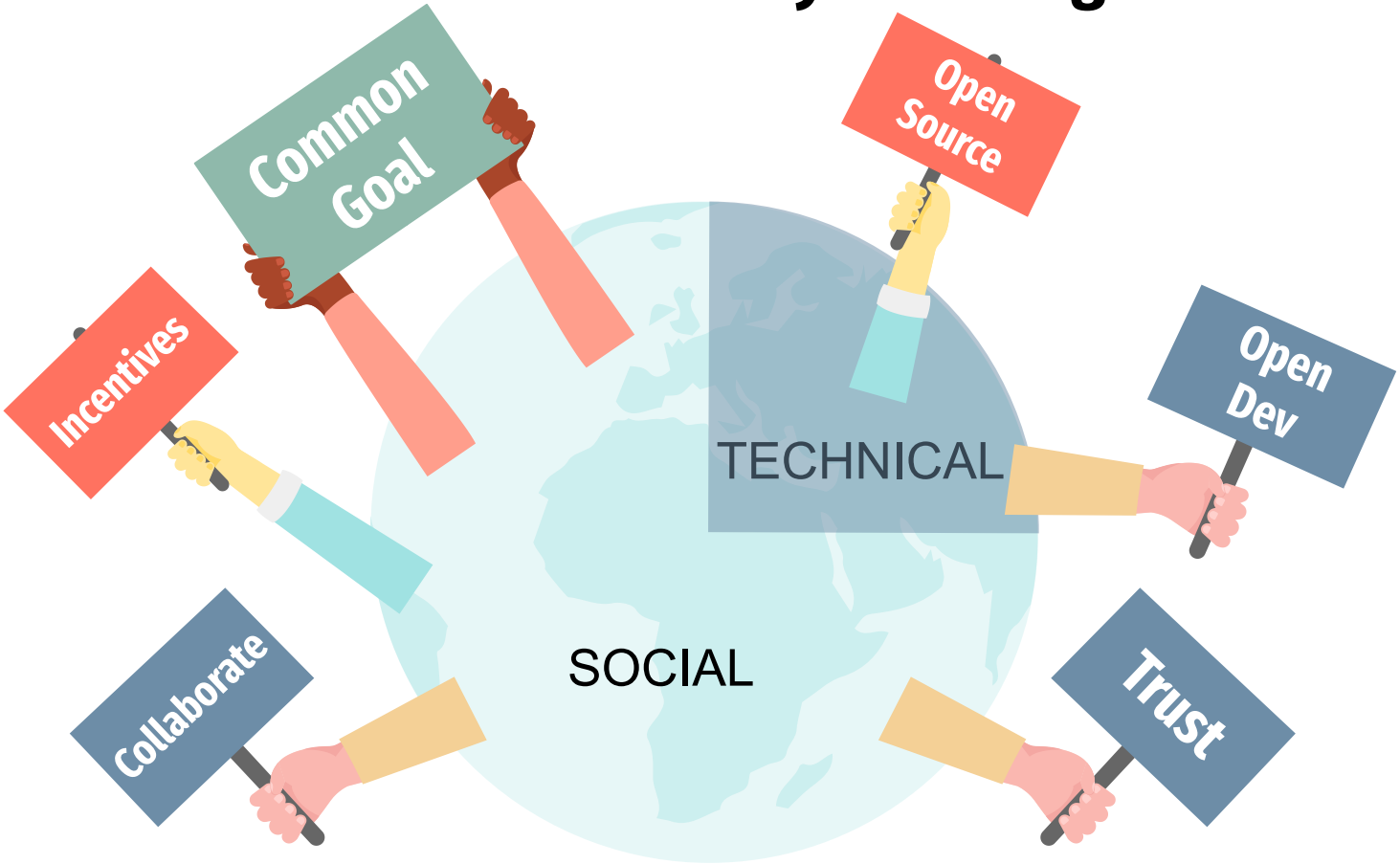
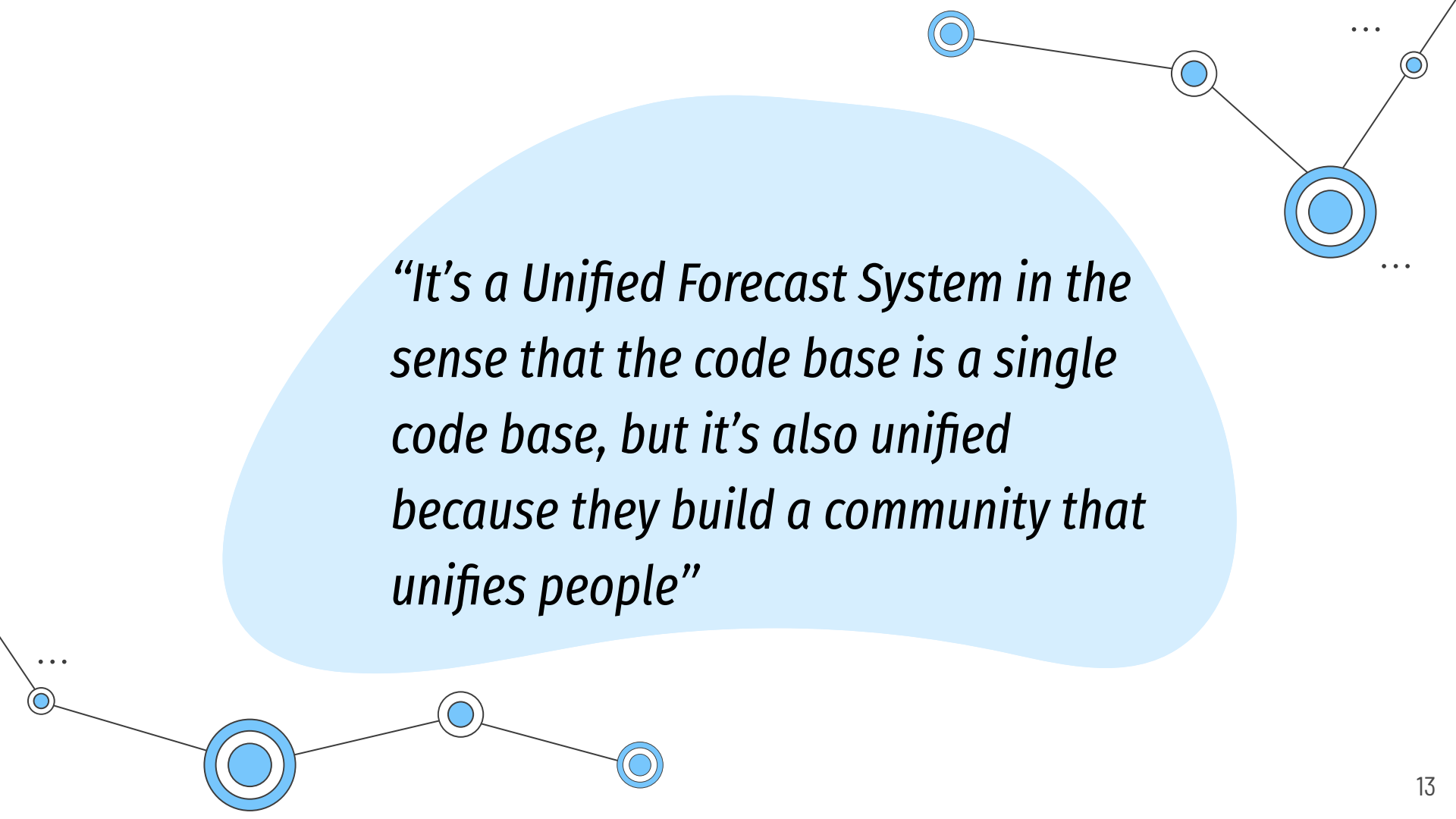
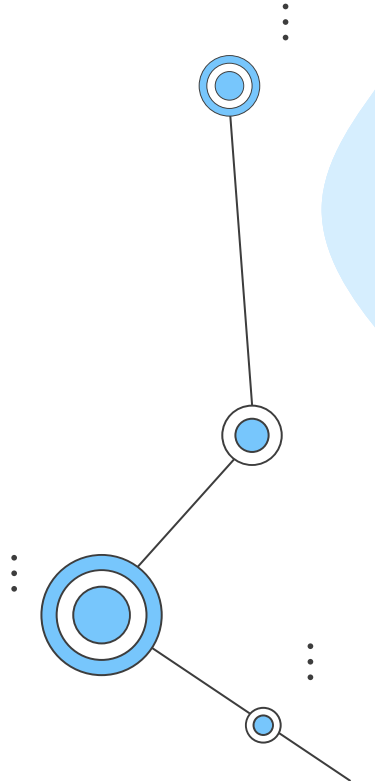
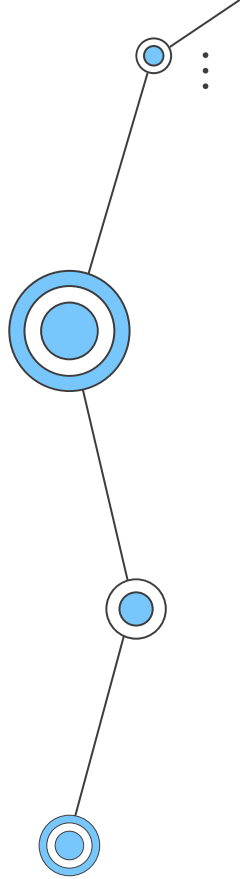



“It’s a Unified Forecast System in the sense that the code base is a single code base, but it’s also unified because they build a community that unifies people”

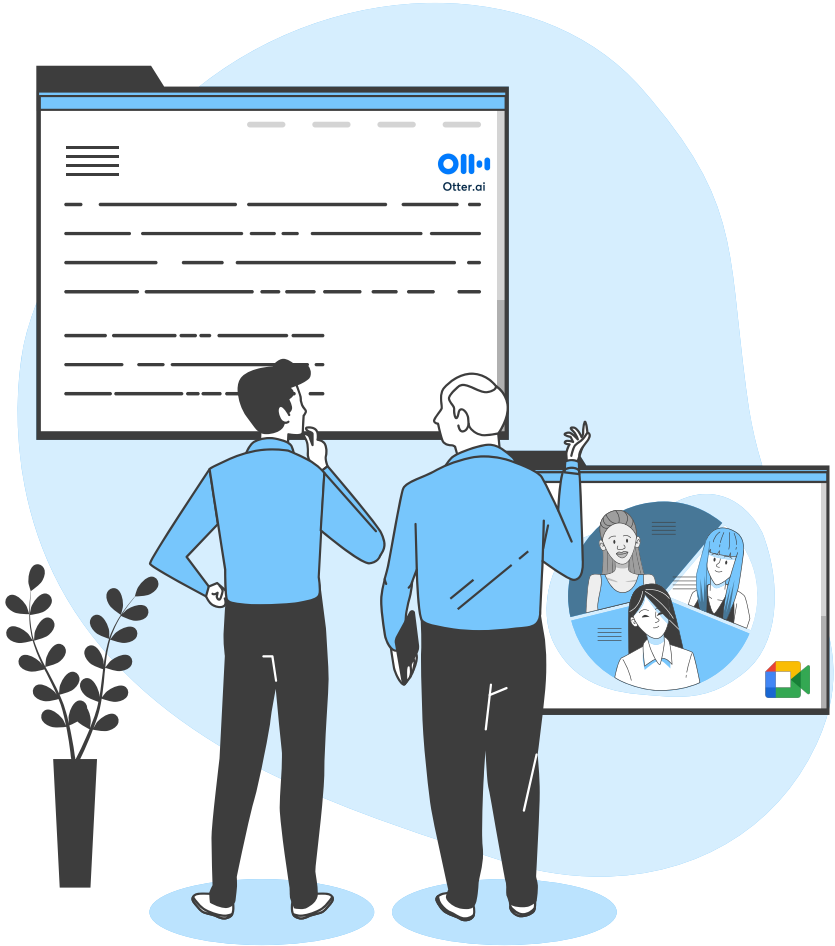
“It's not like you can just toggle a switch. There has to be desire, trust and acceptance on all parties to some level to make this successful.”

“in order for a community... to thrive, everybody has to get something out of it, otherwise they're going to stop showing up.”



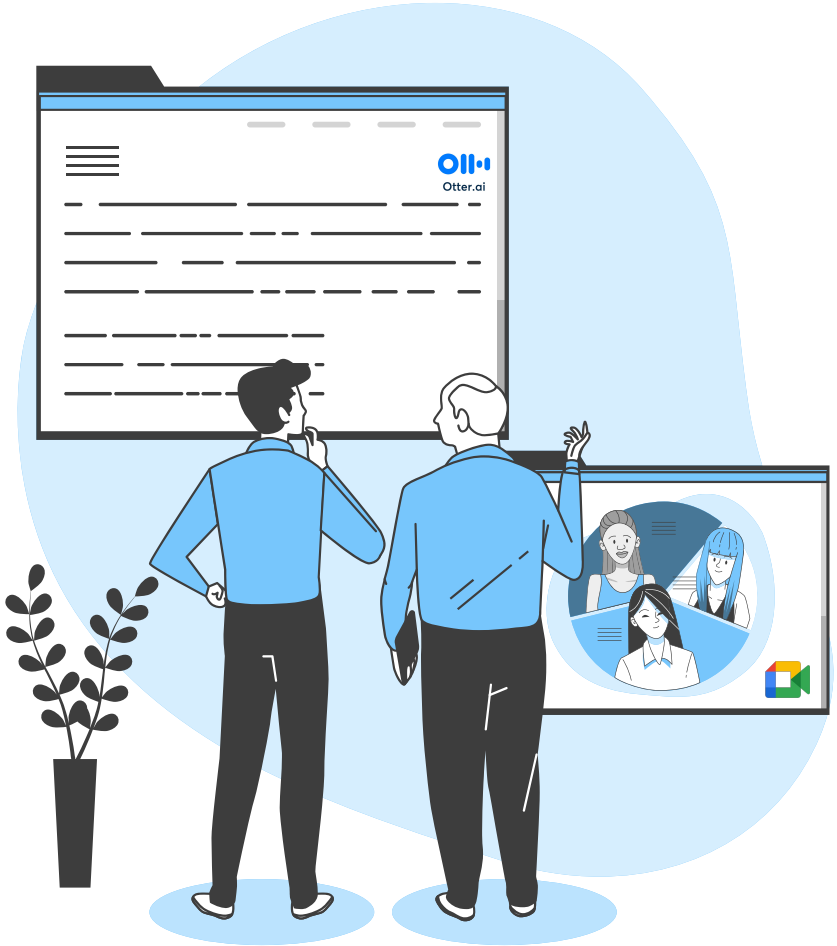


Defining Community Modeling



Defining Community Modeling

- Need a common understanding
- Technical components understood
- Community components had many parts
- Tracking and benchmarking
- Two definitions



Community Model - noun

"A tool for simulating or predicting the behavior of a dynamical system" like coupling the atmosphere, ocean, and land that is accessible to anyone through open source development technology that works across different technical platforms.*

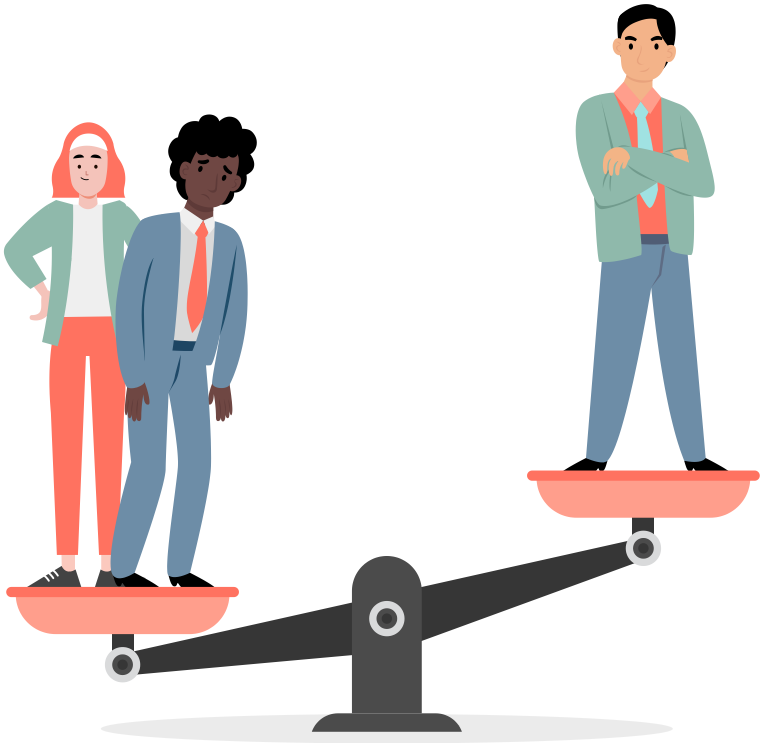
*AMS Glossary: Model

Community Modeling - verb

The active engagement of a group of individuals, representing multi-disciplinary, multi-sector, and multi-organizational backgrounds, who collaboratively contribute regularly to a community model where members develop shared goals and values that facilitate a sense of belonging.

Community Model(ing)

Community



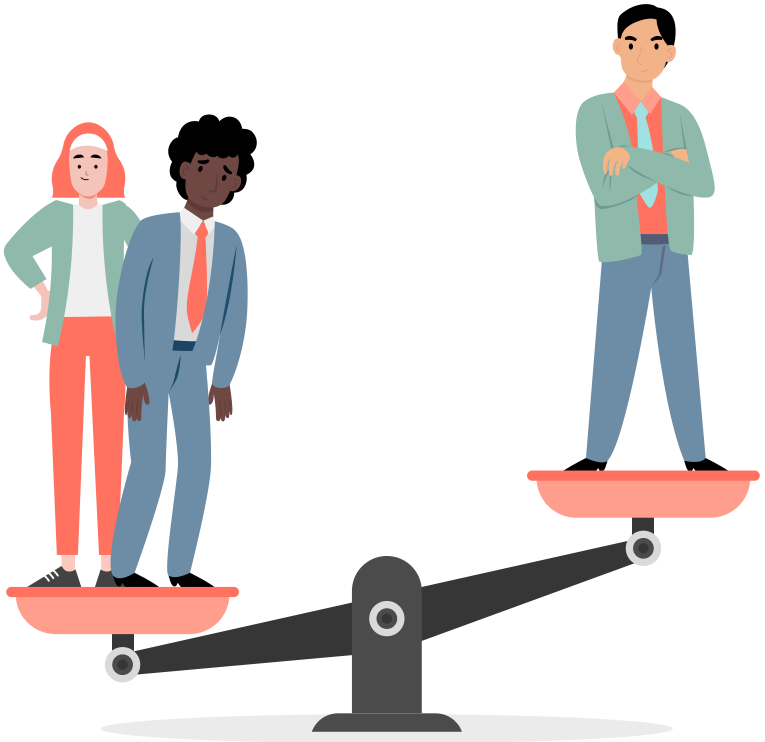
Technology

- The code
- Open access
- Open development
- Cloud computing

Community Model(ing)

Community

- Membership
- Sense of belonging
- Common goal
- Influence
- Collaboration
- Incentive
- Culture



Technology

- The code
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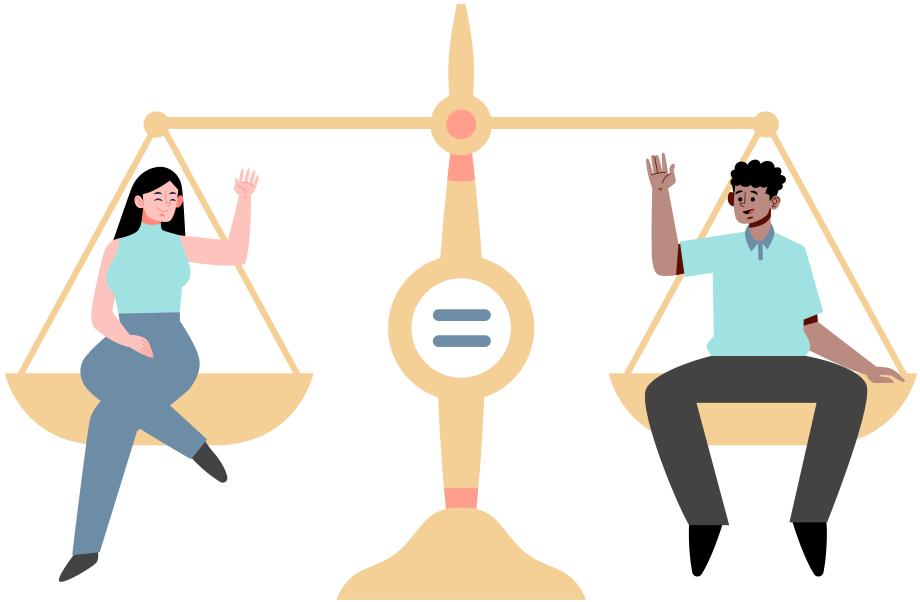
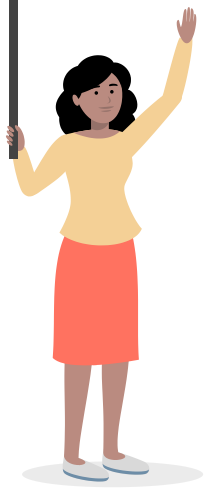
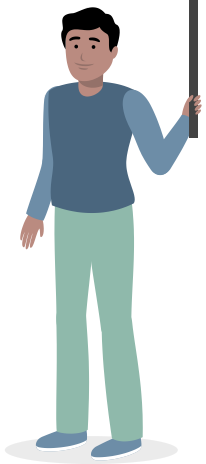


“We need to invest in tools that bring the community together... to organize and cultivate this community, it's not going to come together on its own.”

“Innovation does not happen with code and seminars, it needs to be creative community collaboration which is a good long term goal”

FINISH LINE?





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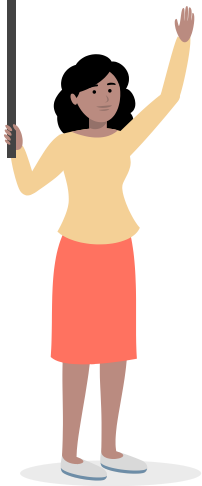
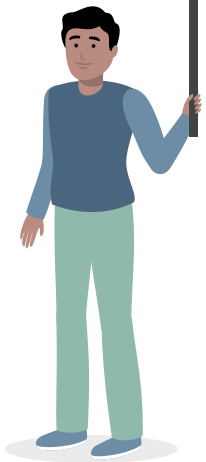


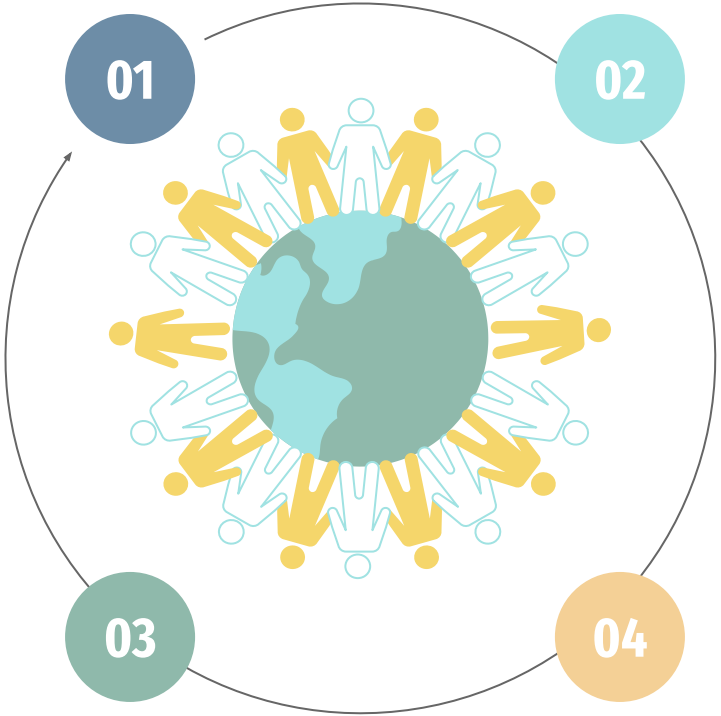
- Who is the community?
- How do we build?
- How do we incentivise?
- What is our culture?
- What is our common goal?



There are FOUR main points that jump out of Michael's talk

People
Want to feel included.

People
Want to work together toward a common goal.



People
Need incentives to change their behavior.

People
Want to feel that their work matters.

Communication Factors Influencing Flood-Risk-Mitigation Motivation and Intention among College Students

Adam M. Rainear1 and Carolyn A. Lin2

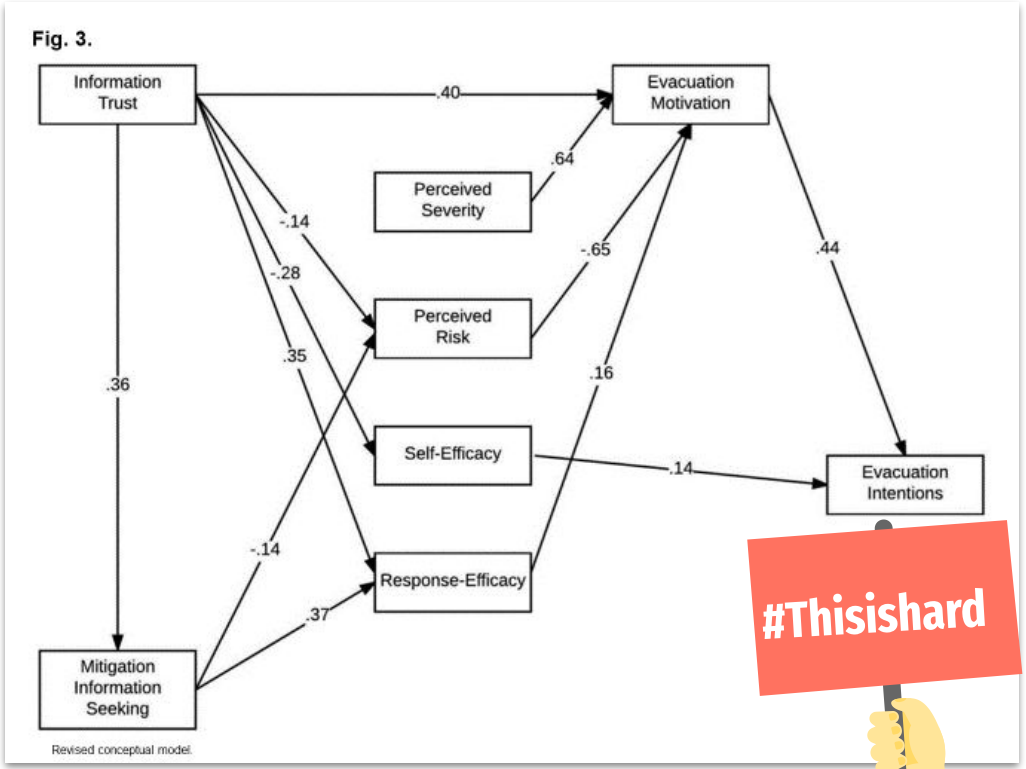
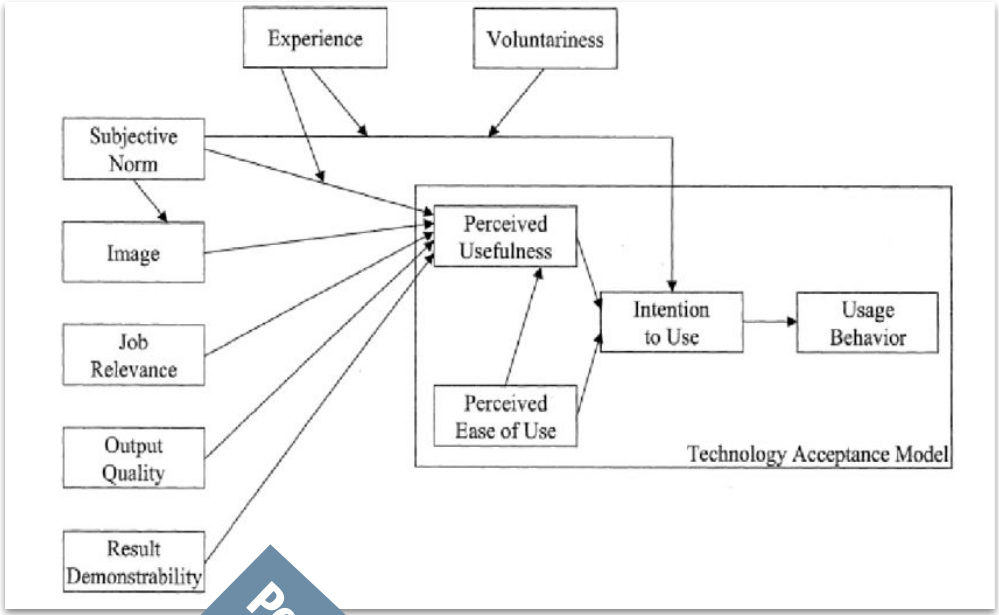


Fig. 3.
Revised conceptual model.

Citation: Weather, Climate, and Society 13, 1; 10.1175/WCAS-D-20-0016.1

Takeaway: Understanding people's motivations and how they link to behavioral intention is hard!

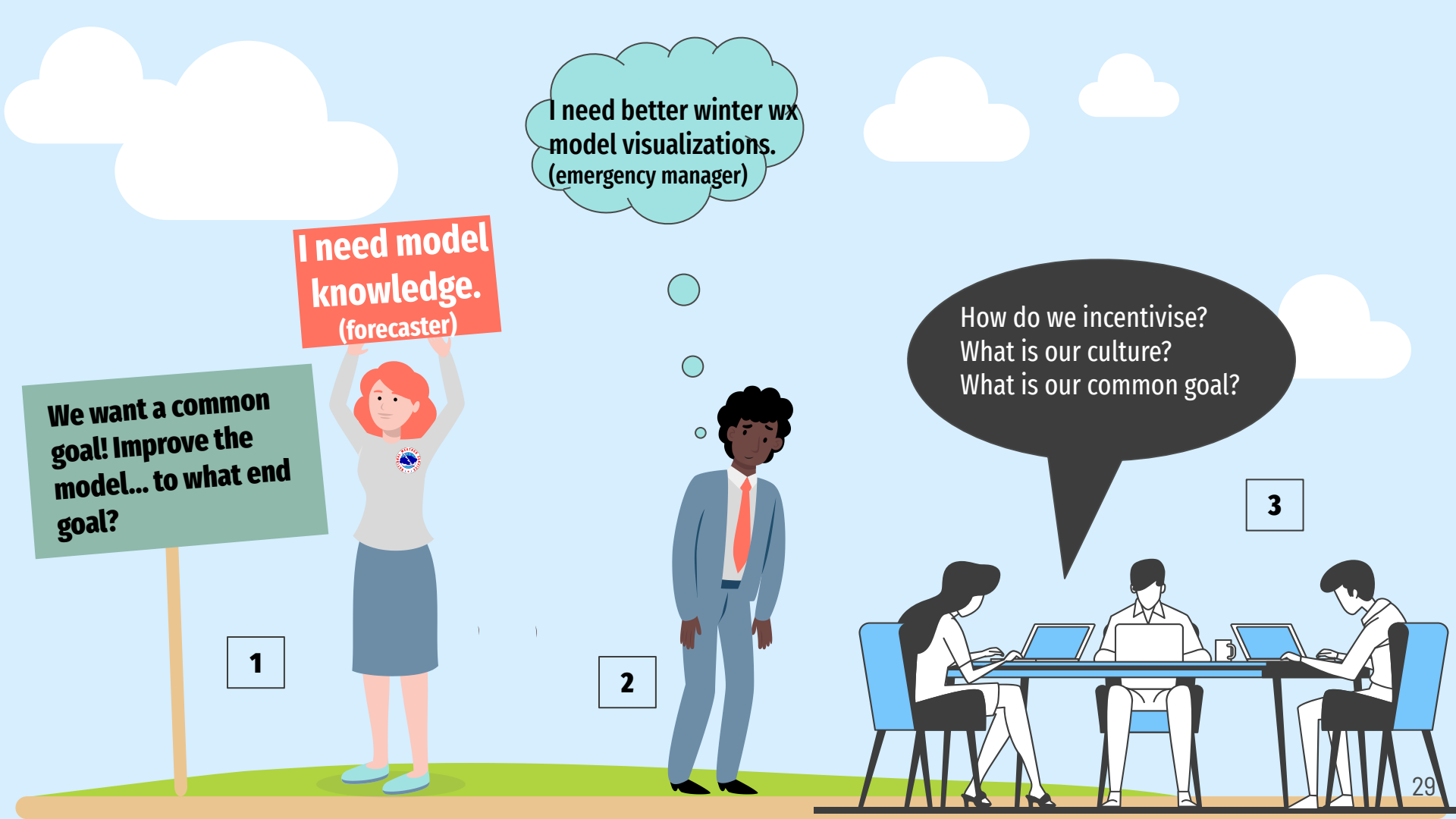
Technology Acceptance Model 2 (Venkatesh and Davis, 2000)



- Subjective norm – An individual's perception that other individuals who are important to him/her/them consider if he/she/they could perform a behavior. This was consistent with the theory of reasoned action (TRA).
- Voluntariness – This was defined by Venkatesh & Davis as "extent to which potential adopters perceive the adoption decision to be non-mandatory" (Venkatesh & Davis 2000).
- Image – This was defined by Moore & Benbasat as "the degree to which use of an innovation perceived to enhance one's status in one's social system" (Moore & Benbasat 1991[3]).
- Job relevance – Venkatesh & Davis defined this as personal perspective on the extent to which the target system is suitable for the job (Venkatesh & Davis 2000).
- Output quality – Venkatesh & Davis defined this as personal perception of the system's ability to perform specific tasks (Venkatesh & Davis 2000).
- Result demonstrability – The production of tangible results will directly influence the system's usefulness (Moore & Benbasat 1991).

Source: https://en.wikipedia.org/wiki/Technology_acceptance_model

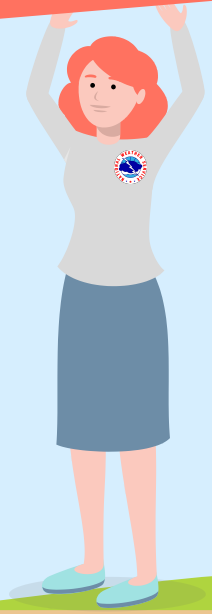
If we want change and innovation, then we need to listen to the people, to the community ...

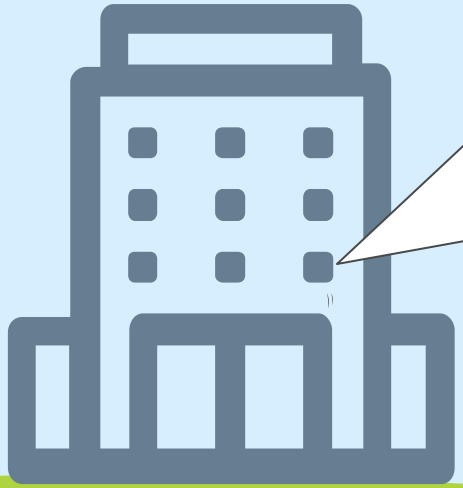

I need better winter wx model visualizations. (emergency manager)
I need model knowledge. (forecaster)
We want a common goal! Improve the model... to what end goal?
How do we incentivise?
What is our culture?
What is our common goal?
1
2
3

1 Is a model just about the code? (*Hint: NO*)

Scan me for source:

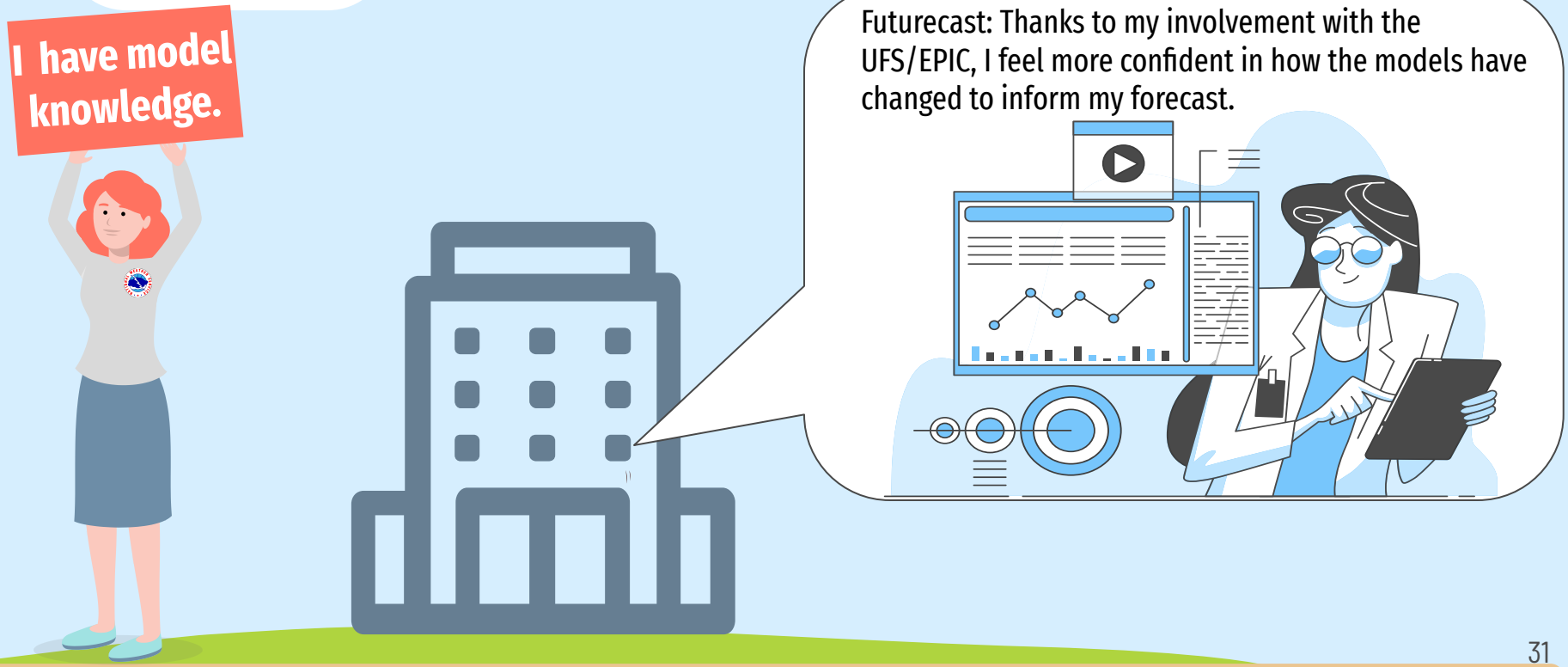
I need model knowledge.





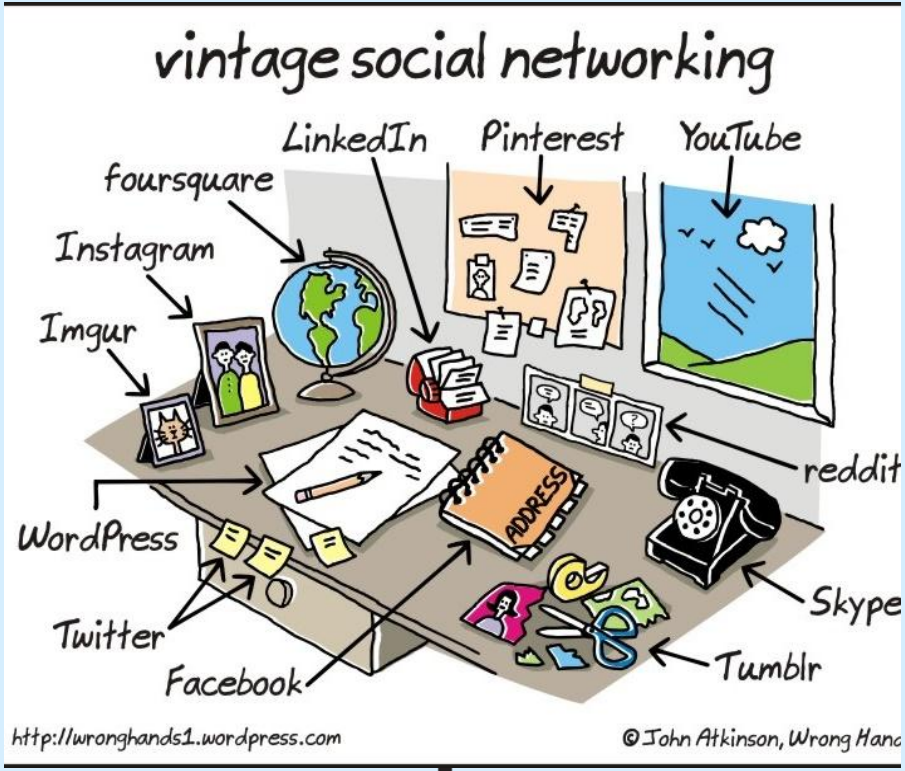
I know “updates to the models, and better resolution have reduced model errors. [But,] this makes it difficult to know how much to correct for these biases.”

1 A model is more than a widget. Forecasters need knowledge.



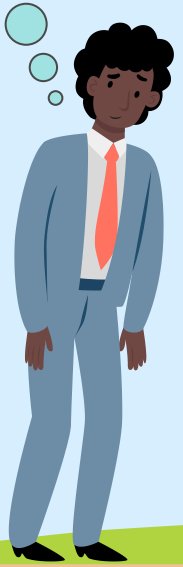
1 **Takeaway: Sometimes innovation is a small, yet meaningful change.**

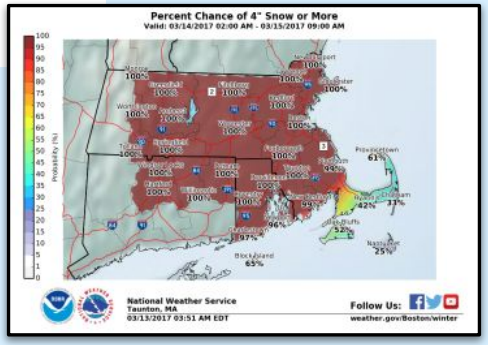
Transfer knowledge with the model.

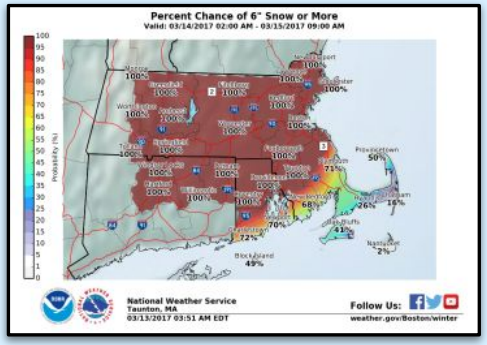


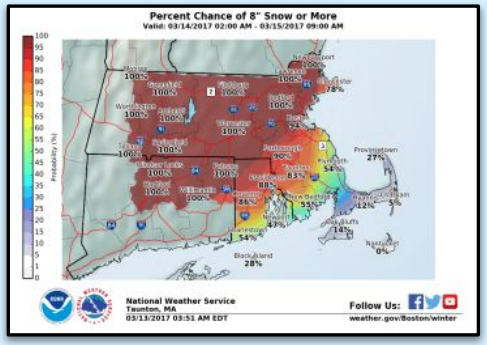
2 Let it snow, maybe. A complex story of meeting user needs.

I need better winter wx model visualizations. (emergency manager)









2 Snow amount was nice to know. Timing was most important.

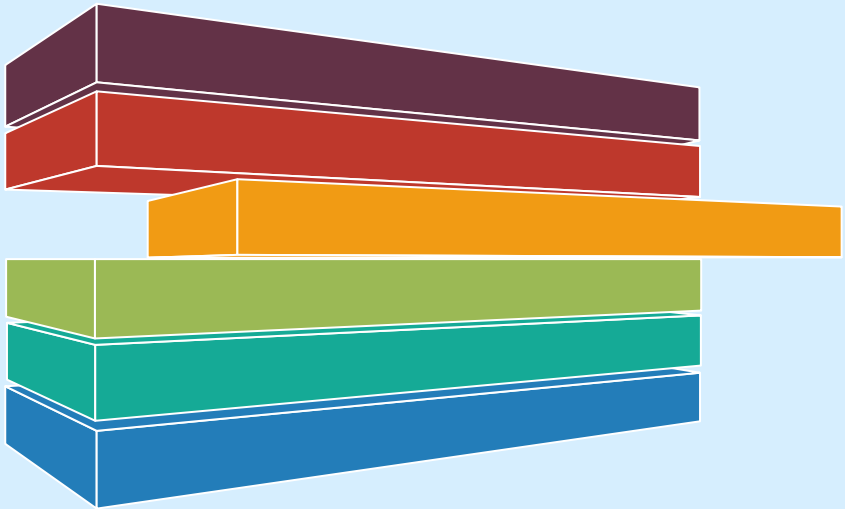
Character of snow

Temperature

Precipitation Type

Confidence

Storm Trends



Timing

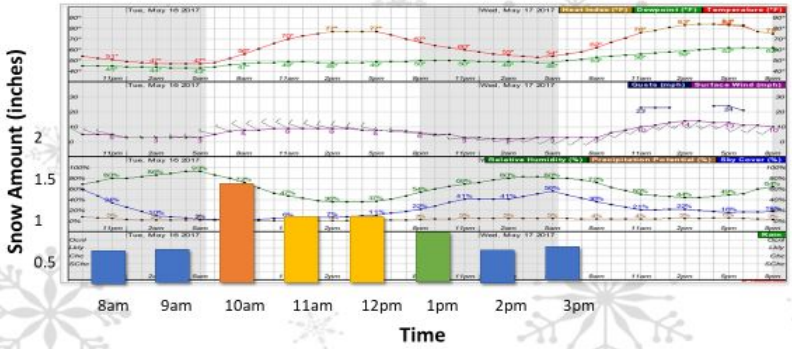
The key ingredient from every user.

- Duration
- Onset time
- Hour by Hour rates

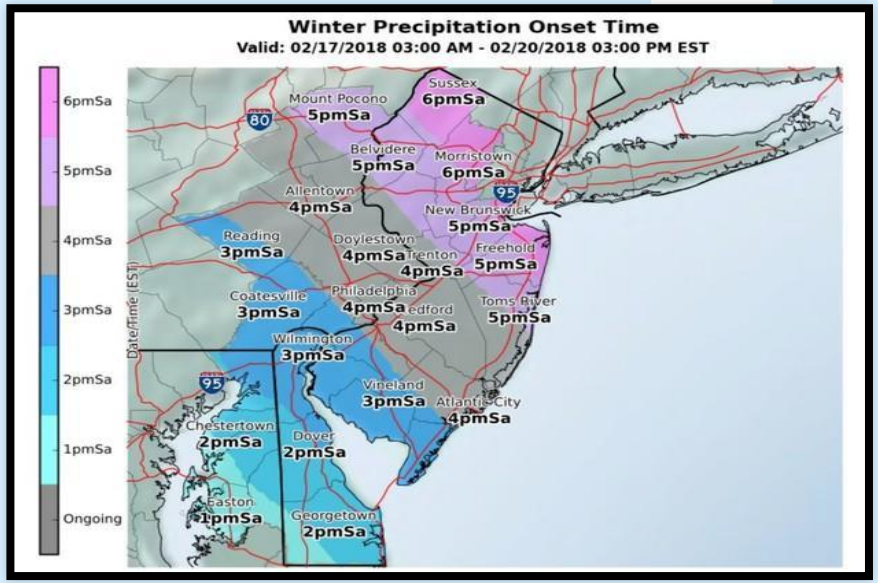
2 Let's use the ensembles to show timing information.

Suggestions

- Make an "enhanced hourly weather graphic"



Gina's mock up from a 2017 presentation. ↑



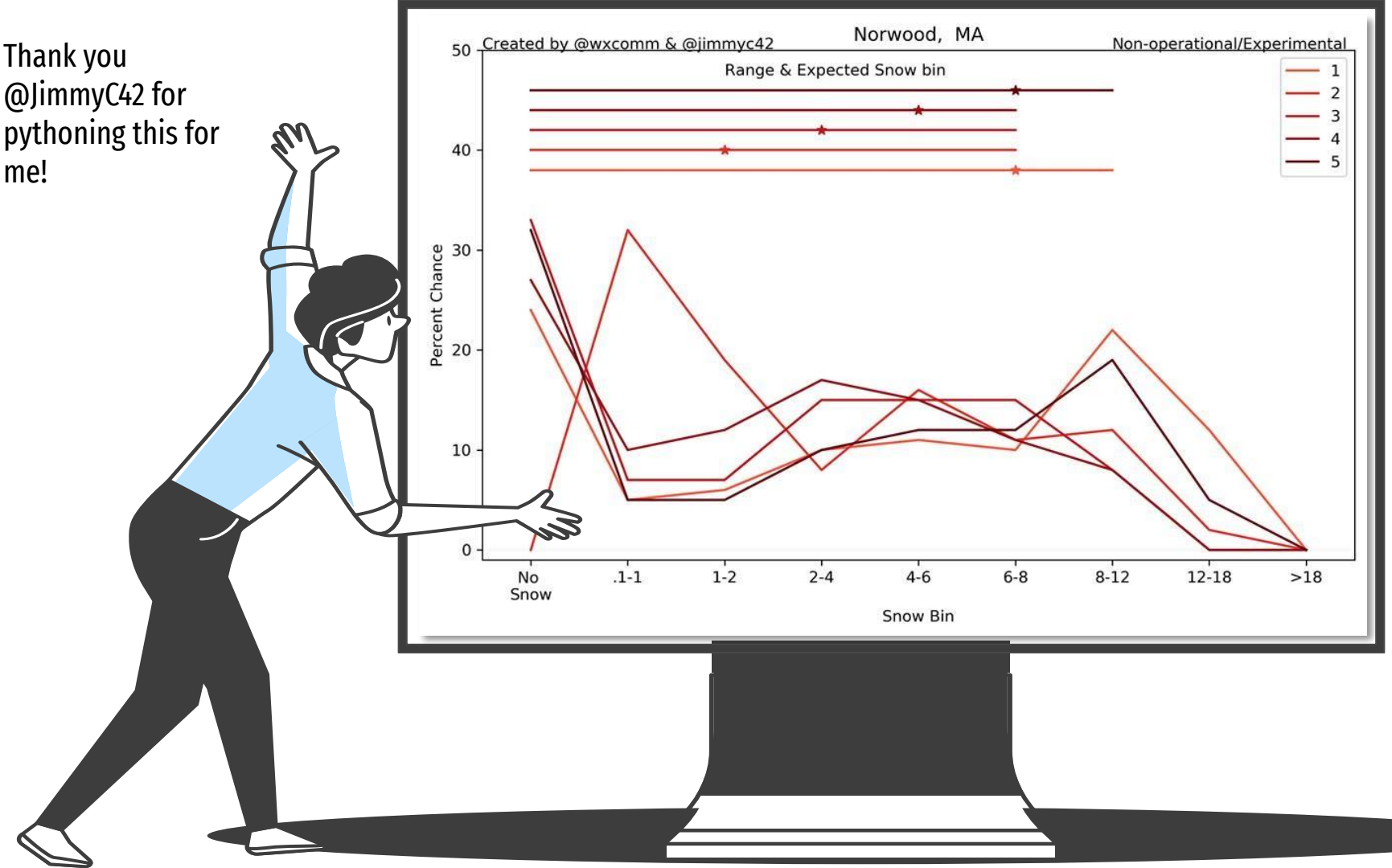
2 But, how confident are you in that information?

During focus groups, users kept saying they wanted confidence information in addition to uncertainty. But what did they mean? We asked!

They defined confidence as…

- The spread of models: Are they in agreement or disagreement?
- How did the models look this run versus the next?
- Forecaster's voice: Did they sound confident?
- Is there a rain/snow/mixed precip line? Is it moving? Trends?

Thank you @JimmyC42 for pythoning this for me!



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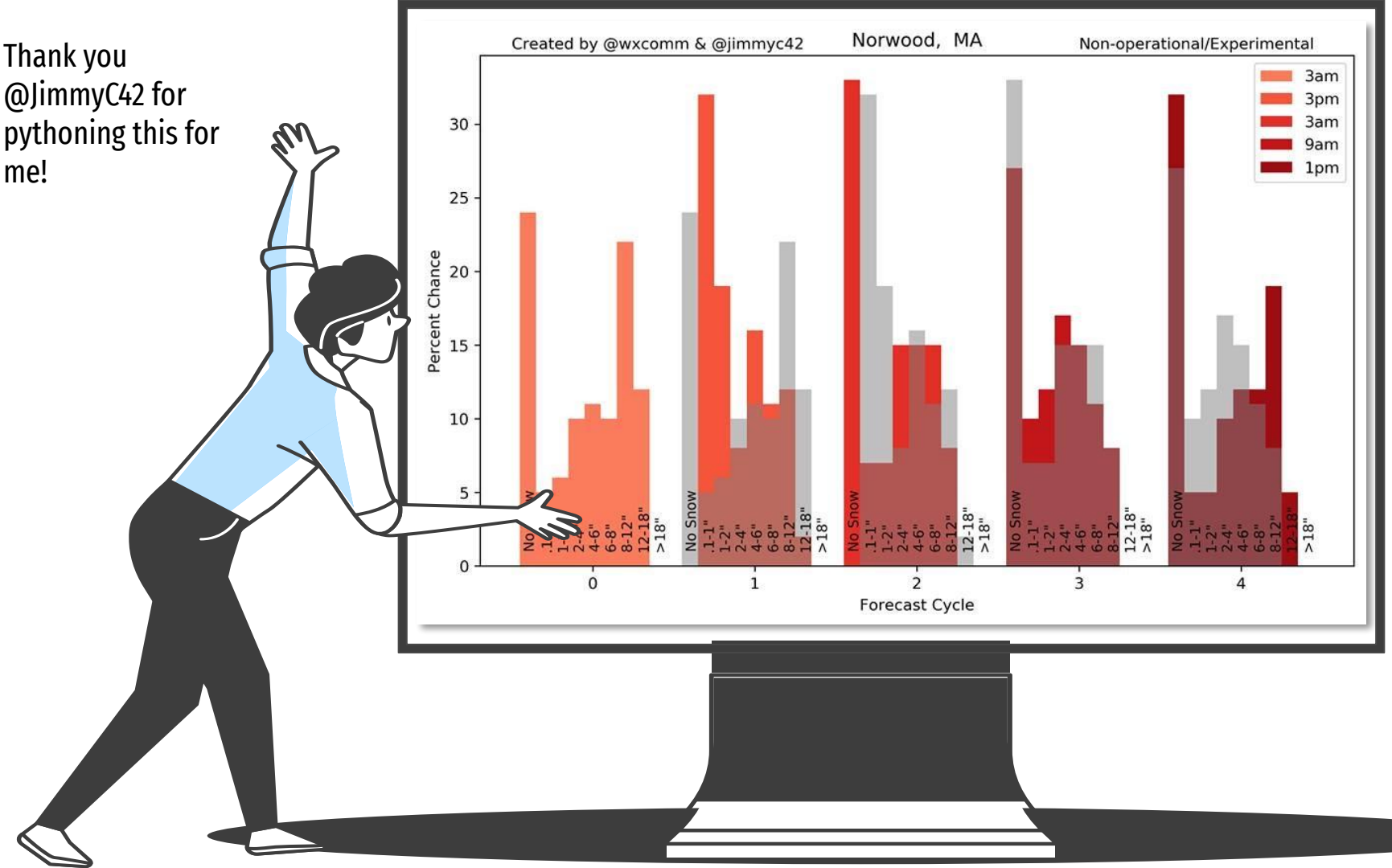

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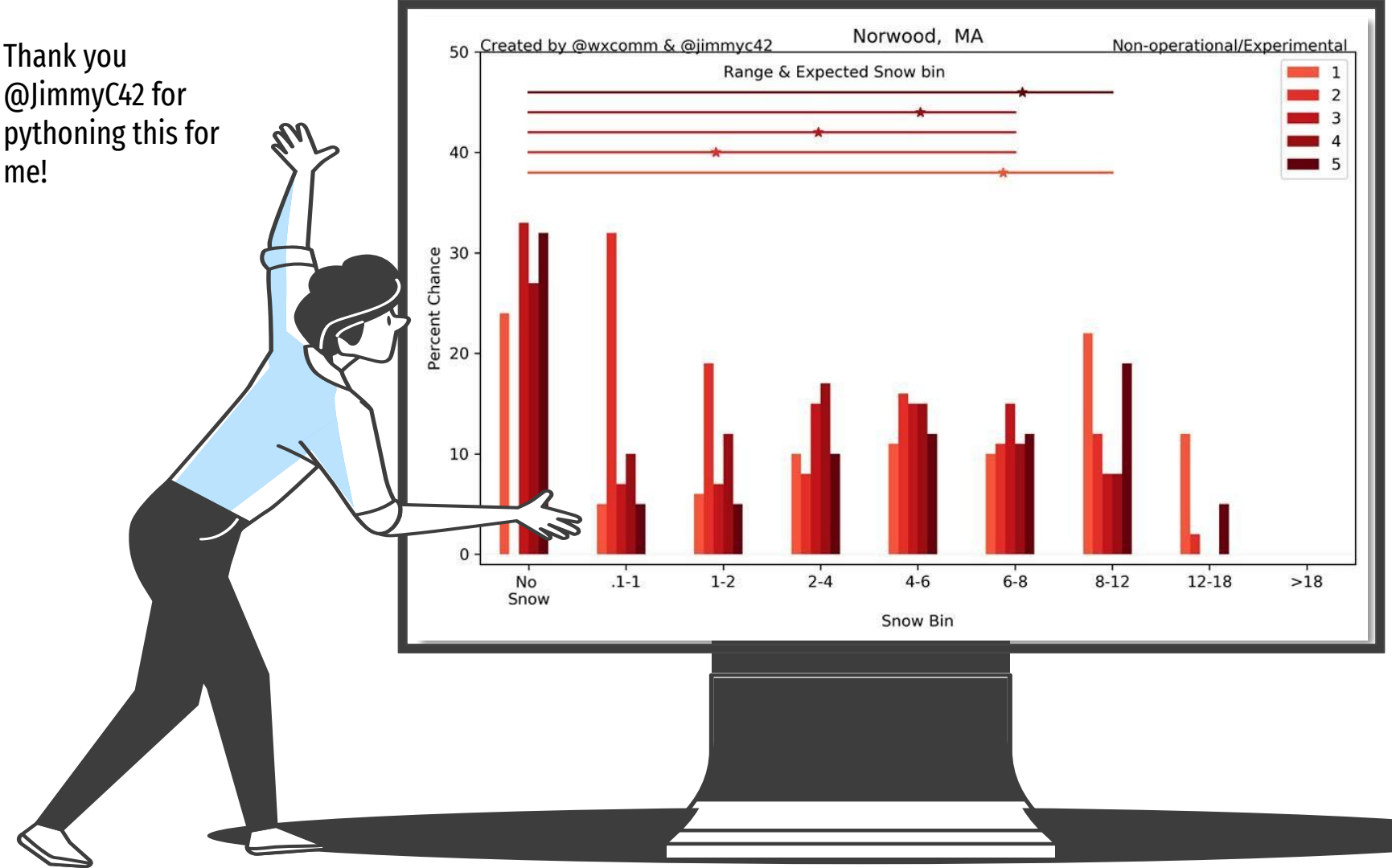

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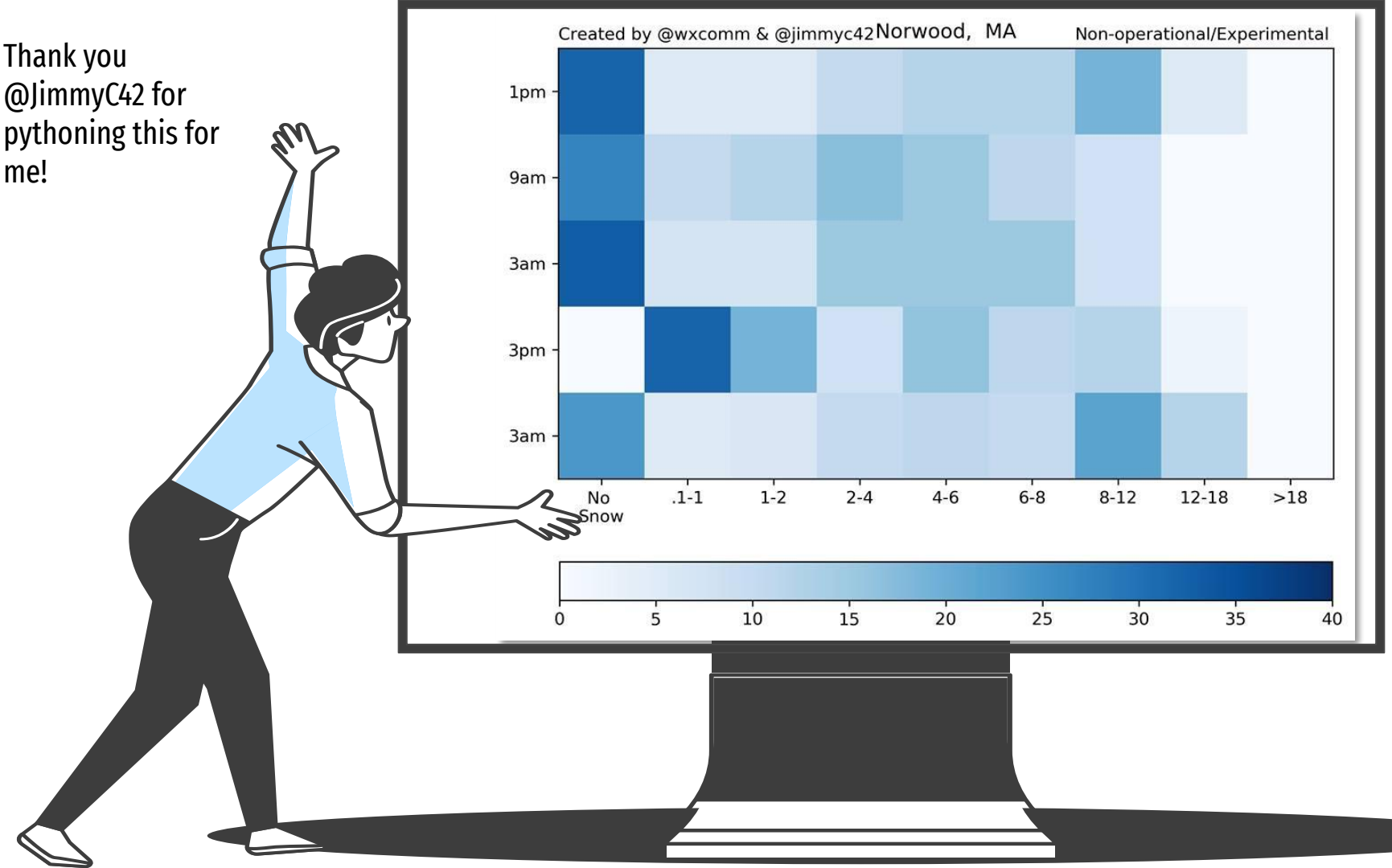
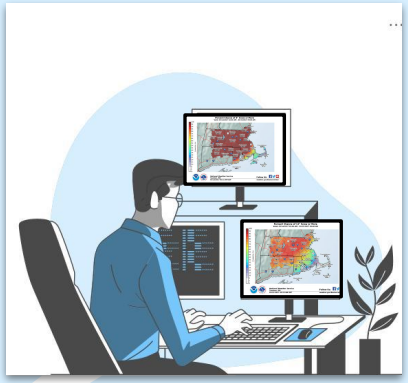


2 And then the data was gone. Why?

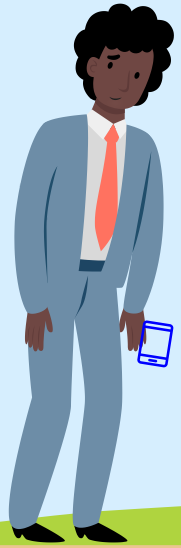


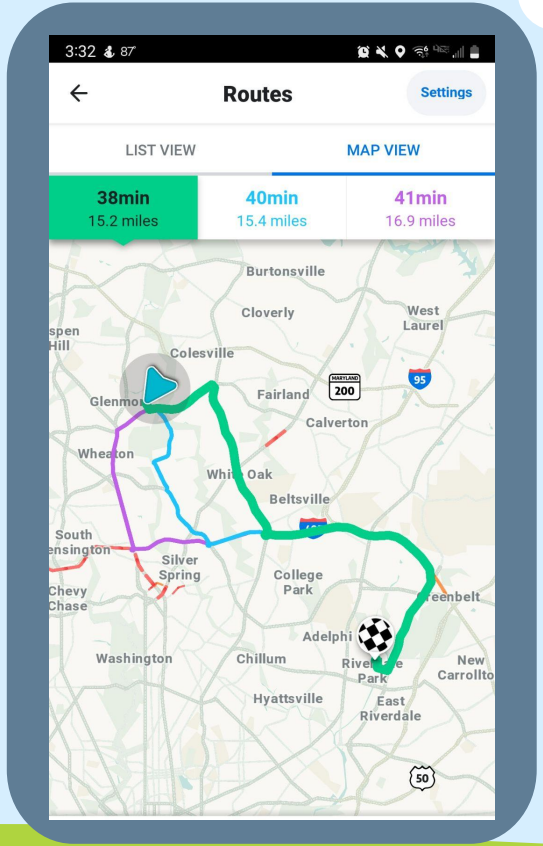
Someone asserted…

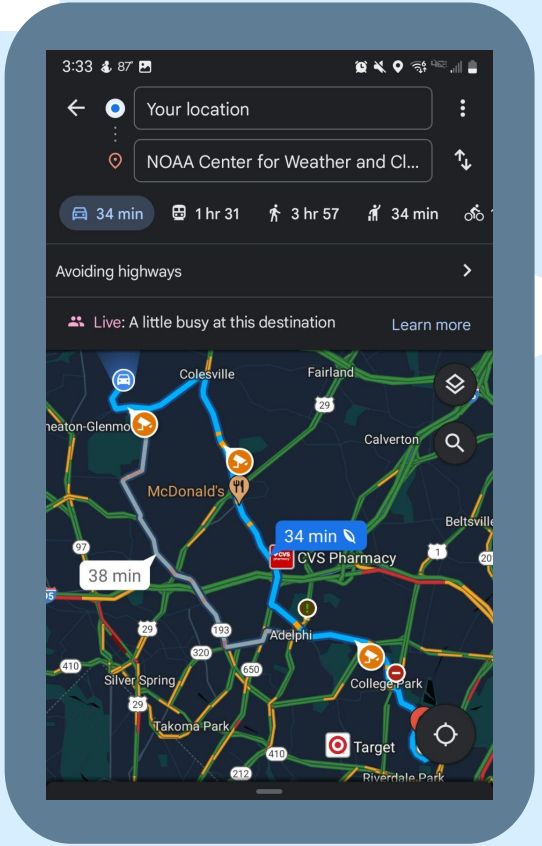
…“People can’t handle more than one mode.”

Have you ever used a traffic app? If yes, then I beg to differ ….

2 Where have we seen more than one mode in widespread public use?





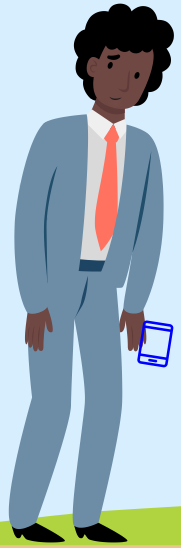


2 Takeaways:

- Assess assumptions before we bake them into post processing as we risk smoothing out signal versus noise.

- Users gave us different desirements...
  - Snow amount is good to know.
  - Timing (or rates) is better to know.
  - Confidence is desired.

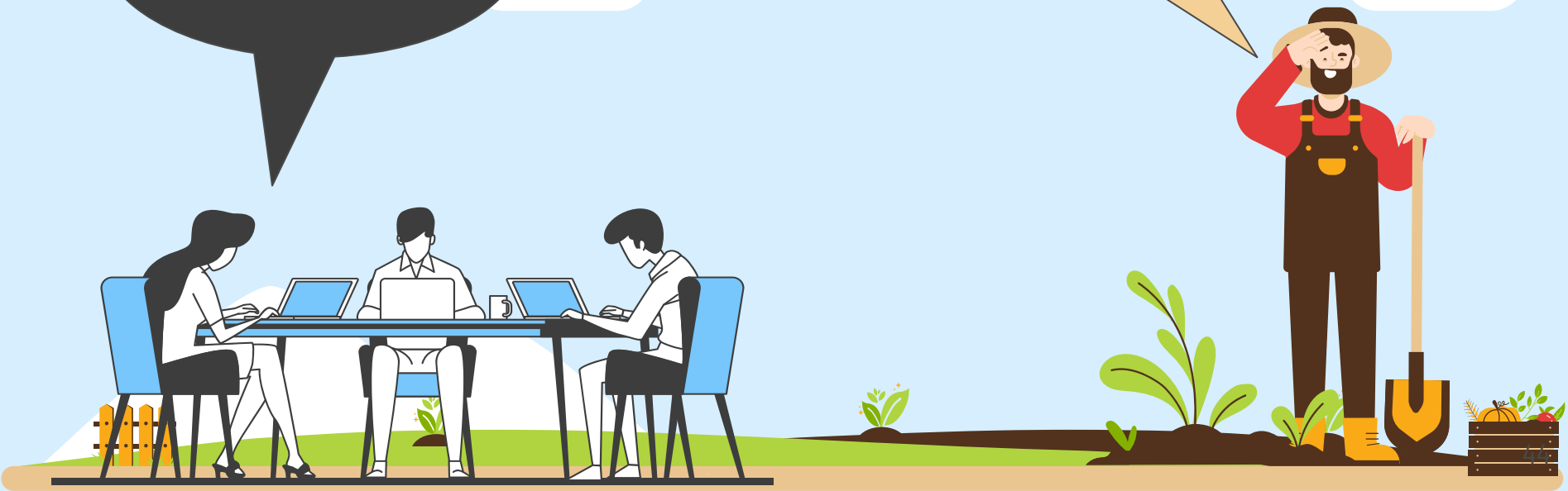
- Social science can help identify user needs to turn into requirements ... to motivate the *common goal*.



3 But, wait, there's more! What about you?

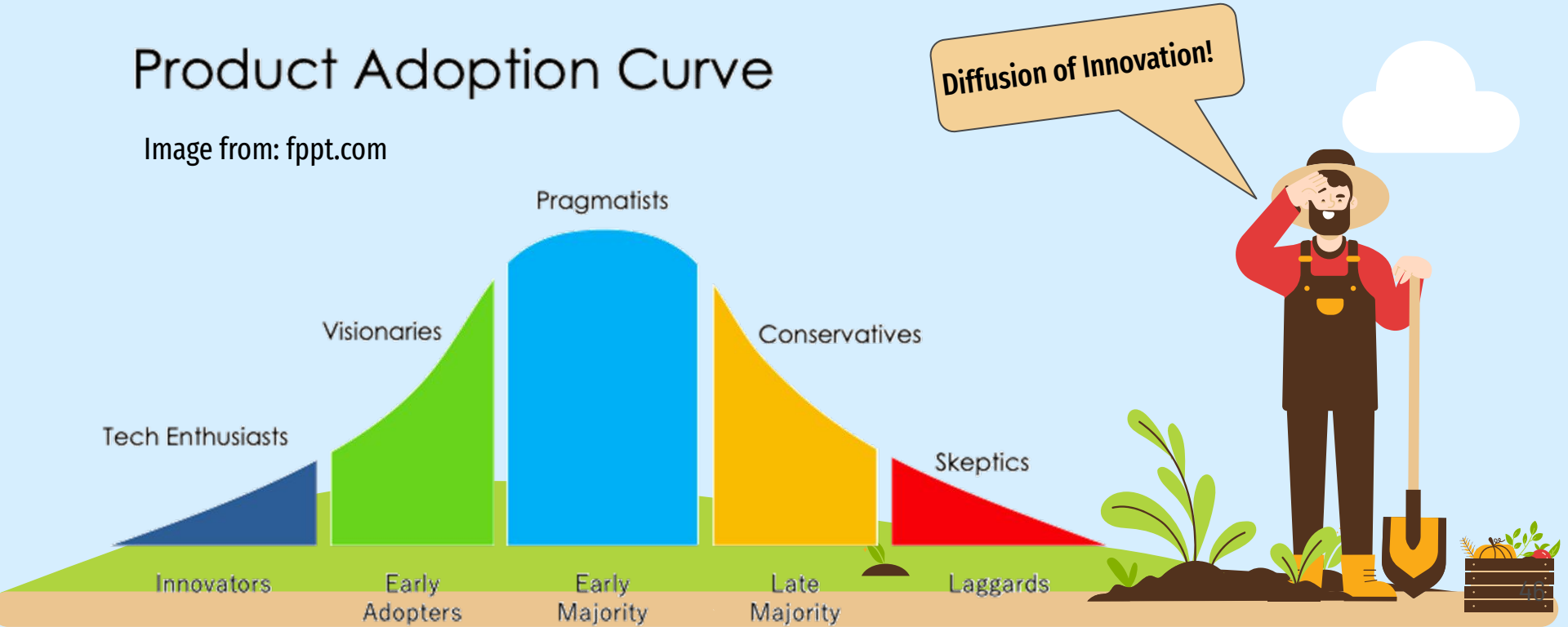
How do we incentivise?
What is our culture?
What is our common goal?

We need to grow into a community!



3 Modelers want meaningful work. Users want meaningful information. We need to science (as a verb!) what this means.

3 *People* innovate. *People* take time to adopt new approaches.



3 This requires *listening* to concerns and slowly addressing them. THIS is an innovation. Just as all the components of a model need to work together, so too do all the social components of the community.

3 Takeaway: When you put people first, innovation will follow.

- Focus on *both* the community model (the thing) and community modeling (the people doing the work)
- Use agile project management to co-create a fluid, yet well-defined system.
- Understand what each sector motivations, concerns, and incentives (e.g. funding, meaningful work, etc.) are, and find a way to negotiate through them.
- Change doesn't happen all at once, and in fact, research shows it shouldn't. Let the negotiations happen over time.
- Encourage boundary people - people who can bridge between more than one sector; We need an ethnographer ... someone who can observe us, help identify dissent, and ways to negotiate through it.

Thank you! Have Questions?

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