

## **Week 11 transcript--Tell a Compelling Story (updated Oct 2022)**

### **11.1.1 Tell a Story**

“Mad Men was a television show that depicted advertising agencies in the 1960s and 1970s. You may notice some anachronisms in their style, demeanor, and language.”

This element addresses the following learning objective of this course:

LO5: Identify the audience and the most effective method to communicate a persuasive argument.

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Joe Harriman, Lynn Taylor. No easements today, unfortunately-- they're all back in the lab.

It's a wonderful facility, but they don't take vacations.

What do they show, slides of them working?

So have you figured out a way to work the wheel into it?

We know it's hard, because wheels aren't really seen as exciting technology, even though they are the original.

Well, technology is a glittering lure, but there is the rare occasion when the public can be engaged on a level beyond flash if they have a sentimental bond with the product. My first job, I was in-house at a fur company with this old pro copywriter, Greek, named Teddy. Teddy told me the most important idea in advertising is to create an itch.

You simply put your product in there as a kind of Calamine lotion. But he also talked about a deeper bond with the product, nostalgia. It's delicate, but potent.

Teddy told me that, in Greek, nostalgia literally means the pain from an old wound. It's a twinge in your heart far more powerful than memory alone. This device isn't a spaceship.

It's a time machine. It goes backwards, forwards. It takes us to a place where we ache

to go again.

It's not called the wheel. It's called the Carousel. It lets us travel the way a child travels, around and around, back home again, the place where we know where you're loved.

Good luck at your next meeting.

## 11.2. Conveying Findings, Part 1

Let's talk about the notion of conveying findings. How do we actually communicate findings to people who have to do things with them? This eventually becomes a conversation about information visualization as one tool, but that's actually a separate course. We're not going to focus particularly on the techniques or the technology of info vis, but talk a little bit about how that fits into a kind of broader notion of how we convey findings. What's actually interesting and worth noting is that, again, scientists and analyst types tend to focus on what are the findings, and then how are we going to convey them to people? But sometimes, it's actually really worthwhile to turn that around on its head, maybe, and spend time at the very beginning thinking about the conveying part and not just the findings part, because conveying findings is a story or problem of narrative structure. How are we going to tell the story? You know, the kind of analytic narrative structure that I typically use is really very simple. It's made up of just five quick elements. What's the question? Where did it come from? What's the answer? How do I know the answer? How did I find that out? And finally, so what? Again, the natural tendency of that narrative structure is to focus on what's the answer and how do I know, and that's what I mean by conveying findings. But interestingly, the people to whom we're conveying may actually want to focus on different parts of the narrative and they may learn from different parts of the narrative. In fact, most people we know learn through the process of storytelling-- telling stories to each other or being told stories. So this has been going on forever. This is how human beings have learned from each other for centuries. In fact, a lot longer than they have been writing, they've been telling stories and many centuries longer than they have been making PowerPoint slides, thankfully. Actually, there's some evidence to suggest that this is not just about technology, it's not just that PowerPoint became possible when we switched to it, it's actually a reflection of the underlying structure of the human brain that we learn better from stories than we ever will from a PowerPoint slide. And you've seen some of the comments and criticisms and parodies of PowerPoint, but we want to make it a positive discussion and talk about being a good storyteller, because that is not, in any way, distinct from being a great scientist. A good storyteller can better frame the discussions, better frame the decisions, and I actually think kind of help elevate data science from

what sometimes might feel like a technical trade to much more of an art form or craft, but it's actually not easy. Telling good stories is not easy and it takes practice. The good news is that it starts with some really intuitive stuff. Consider the story of Goldilocks. It's a classic American fairy tale and if you're not familiar with it, you can find it anywhere on the web and it would be worth taking a read. Here's a picture that is kind of a classic illustration of the cover of Goldilocks. And if you don't know the story, you should go read it. I'm going to summarize it for you really quickly here and it kind of goes like this. This is the core of the story. Once upon a time, there was a little girl named Goldilocks. She goes for a walk in the forest. After a while, she comes upon a house. She knocks on the door, nobody comes to the door. She just goes in and she finds at the table in the kitchen, three bowls of porridge. Of course, like any little girl going for a walk in the forest, she's hungry and so she starts tasting the porridge, and she exclaims after tasting the first porridge bowl, it's too hot. And the story sort of unfolds from there. Most of us who have heard the story even once as children will remember exactly what happens. Right? That story sticks in all of our minds. We know it. Now imagine, if as a child, instead of being told that story, your parents had put up, behind you on the wall, this chart-- a matrix. Papa Bear, hair fur, brown, appetite level, high, preliminary porridge assessment, too hot. It's kind of funny to look at, right? And I'll tell you one thing about it, you wouldn't have remembered it as a kid. Even today, you wouldn't remember the story from looking at this slide. It just wouldn't sink in, and unfortunately, this is what people often mistake in today's world for effective storytelling. Now, if they want to add a dynamic element, sometimes you'll see them tell the story like this-- a kind of flowchart. Event one, event two, event three, event four, or in some times, even like a decision tree, like should she eat the porridge or not eat the porridge? If she eats it, we go down one branch of the tree, if she doesn't eat it, we go down another branch of a tree, like a simple game theory model. That doesn't get into people's brains, either. Interestingly, as groups, we've started to use yellow sticky things, otherwise known as Post-it Notes, to try to unravel stories into their constituent elements and then rearrange them because you can move the Post-it Notes around and there is something slightly better about that process, but how many times have you been in a meeting where someone puts up a flip chart with a bunch of Post-it Notes on it and tries to tell a story by quote "walking you through the Post-it Notes." It's not a story that you're going to remember probably five minutes after you walk out of that room. Even if you actually understand it while they're telling the story, your mind tends to wander. And finally, we tell the story this way, and look at what happens. We draw a Venn diagram of important elements, and instantly, instantly, our eyes are drawn and our minds are drawn to the intersection between the two circles-- that must be the most important part of the story. Now, none of this really helps very much. The parodies of PowerPoint have helped us a little bit at least to recognize some of what's wrong. But in the world that we live in, there's still this kind of odd and arguably kind of dysfunctional resistance to using storytelling unapologetically.

It's almost as if people are looking for alternatives to what is actually the very best way to move the decision making needle from one place to another. Telling good stories actually works.

## 11.3. Conveying Findings, Part 2

Let's move from the story of Goldilocks to the story of metrics and indices-- maybe less interesting but in some ways more important for business decision making. Over time, people have made just ruthless fun of PowerPoint. And the parodies of PowerPoint actually have helped actually with this problem a little bit. If you haven't seen it, there is a simply fabulous lecture about PowerPoint from the TED series. It's actually David Byrne from The Talking Heads talking about how PowerPoint destroys thinking. And it's a little over the top, but here's the link. Now, even so, with all of that parody of PowerPoint, there's still this odd and arguably dysfunctional resistance to storytelling. It's as if people are looking for alternatives to really what is the best way to move the decision making needle. The latest alternative that everybody seems to be turning to is around indices, metrics and indices. Take a look at a recent issue of The Economist magazine or, even better, Business Week. Just flip over there. Once, it was taken over-- in particular, Business Week became Bloomberg BusinessWeek-- they had figured out the power of indices. They're crazy for indices. Pick up a week's edition, and you'll see it, starting with things like a classic example, the World Economic Forum's Global Competitive Index-- you can take a look at the link right here-- ranging to other indices that try to metricize really highly unstructured insights about things like fashion trends. Indices are all the rage. Now, remember that the purpose of an index is almost always to provide context to a data point, and that's supposed to help with decision making. But we all know that indices aren't actually terribly good at this in practice. What most indices do is hide the black box behind the process that's actually being measured. Think, for example, again about the World Economic Forum. You'll find a human capital index, and it ranks countries on the basis of their readiness for the knowledge economy. That sort of hides the process of what's really going on. What does that actually mean? Second thing is anybody who's worked with these indices knows that the indices themselves become a kind of competitive end in and of themselves. I work in a college. Colleges focus relentlessly on trying to raise their ranking in the annual US News and World Report Survey of Higher Education, even though every college president will tell you that the rankings don't mean anything. And in fact, they make fun of the rankings, but they're still trying to raise their measure in them. And then finally, many indices, more frequently than any of us would care to admit, are just simply aggregations of someone's opinion-- in other words, not really so much a metric but what other people say about a metric. Some of the World Economic Forum indices are particularly suspect

in this regard. Many of them, if you look closely, are actually asking the members of the World Economic Forum what they think of each other's companies or what they think of each other's countries. That's kind of an echo chamber. And although public opinion is good to understand, it's not the same as reality. And echo chambers actually don't make for very effective storytelling environments.

## 11.4 Narrative Structure

Discussions Prompt

Spend five minutes on the following prompt.

Recall the narrative structure Steve Weber discussed:

- What's the question?
- Where did it come from?
- What's the answer?
- How do I know that?
- So what?

Do you use part (or all) of the narrative structure in your presentations and reports? In particular, how much time do you spend on the “how do I know that?” In other words, do you articulate how you know the data tells you what you purport it tells you? How much time do you spend on the “so what?” In other words, do you make a conscious effort to convince the audience why your topic matters?

## 11.5 Tell a Good Story, Part 1

This element addresses the following learning objective of this course:

- LO5: Identify the audience and the most effective method to communicate a persuasive argument.

OK. So we want to talk about the basics of good storytelling, which are consistent across human experience whether you're using an enormous data set or whether you're just telling a fairy tale to one of your children, or anyone else that might be listening. And I think there's really two rules, and I want you to just abstract for a moment away from thinking about the data set and focus on these two rules. And they're real simple, but they're actually pretty important to keep in mind.

So the number one rule of storytelling is a story is for the audience, not for the teller. The

story is for the people who are listening, not for the person who's telling it. Now that seems completely obvious, but people forget it frequently.

Now let me be clear. It doesn't mean that as the storyteller, you can't have fun with your story. In fact, you should. And it doesn't mean that you can't really feel passionate about the story you want to tell with your findings. Of course you want to feel passionate.

What I'm really saying is, you can't fall in love with your story. Like no matter how good it is, you can't fall in love with your story. And that may sound strange, but you know, we've all seen this mistake.

We've seen cases where the teller, the person who's telling the story, is so in love with their own story that they don't see the flaws in it, they don't see the boredom among the people who are listening, they don't see the questions that are welling up in other people's eyes. Sometimes they actually forget to even look to see if anyone else cares. In some cases, you know, we've all been in this experience where someone is telling a story that is so important to them that they really don't see that their audience is getting lost or that their audience doesn't care.

And just parenthetically, I think this is one of the reasons why some great TV shows, if you think about it, they sort of always tend to, like, weaken or maybe even die out in the third or the fourth season. And I think it's also why sequels of great movies are rarely great. The problem is that the writers, the people who are developing the story, start to fall in love with the story itself. They fall in love with their own characters and they forget the audience.

And so go back and think about some very successful TV-- The Sopranos, if you remember The Sopranos on HBO, the third season sucked, and then it got good again once people fell out of love with the story. This year, 2017, I just happened to be watching the fifth season of The Americans, which is this great spy kind of series about the 1980s, and it's not as good because you can feel, like, the writers have fallen in love with their story, and this is not a good thing.

So look. The bottom line here is echo chambers do not make for effective storytelling environments. And no matter how excited you are about the story that you want to tell with your data product, do not fall in love with it. Period, full stop.

So that's the first rule. Here's the number two rule. The second rule is to be very clear in your own mind about the difference between plot and story. The difference between plot and story. And so let me be very clear about what I mean by that.

The plot is the analytical argument. It is the series of events that happens or the sequence of arguments you want to make. The story is the emotionally resonant kind of

thing that gets into people's heads and which they remember.

Social scientists are often very uncomfortable with this distinction, but I don't think actually they need to be. So I'll give you a kind of-- a classic example from the world of political science that I encountered in graduate school.

A very important book written in the 1980s by Robert Axelrod called *The Evolution of Cooperation*, which some of you may know. It's a book about iterated prisoner's dilemma games. The plot sounds like this. For Axelrod, the plot is the folk theorem in game theory that says that in an iterated prisoner's dilemma game with a long shadow of the future, any equilibrium can be supported, including sustained, decentralized cooperation. That is not something that anyone other than a game theory geek is going to remember, even though it's like, literally, the folk theorem.

The story actually comes in the second half of the book when Axelrod recounts the live and let live system that evolved in trench warfare during World War I. He tells this wonderful story about how norms of cooperation evolved between the German and French soldiers in trench warfare through their eyes, and then sort of imposes the theoretical framework on top of that story to cement it in people's imagination.

And so actually, if I had written Axelrod's book for him, which I would never presume to do, I would have actually put the story before the plot. I would have told the story about the live and let live system first, and then go on back and explain the meaning of that story through the iterated prisoner's dilemma plot.

And I think the same kind of reasoning can be applied to almost any good data science story. So over time, it's worth thinking about stories that enable plots, rather than the other way around. And we've experimented with that.

And one of the ways that I think is kind of interesting to get a flavor for that, again, is to kind of put the data science aside for a while and think about the stories that have been most impactful on you over time, and even more so, even more specifically, think about the opening lines of those stories and the way they drag you in.

So I made a list of the ones that I like the best. There is a famous Alfred Hitchcock movie named *Rebecca* from a book by Daphne du Maurier that, if you've seen it, you'll never forget the opening line. "Last night, I dreamt I went to Manderley again." So that opens up and wants you now to tell me, how does that-- why is that important? What happens?

The classic one that most literary scholars usually refer to, of course, is *Moby Dick*. What is the first line of *Moby Dick*? "Call me Ishmael." It's not, my name is Ishmael. It's not, some people call me Ishmael. It's not, I am Ishmael. It's, "Call me Ishmael," and it

opens to an entire story about why someone would say something like that. One of my favorite spy novel starts by saying, "It had been at least a year since I had killed anyone." That's a pretty good one too.

And then finally, of course, for any inductive-- or, excuse me, abductive social scientist, this is the one that sticks with you forever. And I'm just going to read it, because I want to get it absolutely right, from Arthur Conan Doyle. "Mr. Sherlock Holmes, who was usually very late in the mornings, save upon those not infrequent occasions when he was up all night, was seated at the breakfast table." You want to read the rest of this story. You want to know what happens next.

And the point is not to say that data science is about stories. Of course it isn't. The point is to say that it is a fallacy that science, good science requires plot only, and that storytelling somehow detracts from good science. I think that's a silly way to think about it, and it just doesn't reflect the way human beings actually listen and learn.

And so I want to end this by saying, look. Here's how I think about it, and I hope you will at least experiment with this approach. I've never accepted the notion that science, theory, and narrative are at cross purposes with one another. I actually think they can easily work together. And fundamentally, if you want to bring about real change in what people believe and what they will do as a result, you ultimately have to tell compelling stories that embed the science and the theory in some kind of a narrative.

Because after all, as we've talked about earlier in this course, in most organizations, stories do battle with other stories, and I think an effective research agenda needs to acknowledge that reality to sort of own it. That doesn't mean sacrificing theory. It doesn't mean sacrificing scientific integrity. It simply means that the stories that matter are the stories whose plot can be vigorously defended with logic and evidence, and those are the data science stories that can change the world.

## **11.6. Tell a Good Story, Part 2**

There are lots of things to consider when creating a great story. And we're going to focus on three that are most valuable we think to you as a data scientist. First, knowing your audience. Second, knowing the point of your story that you're telling. And third, structuring your story so it's understandable by your audience. First, let's look at the audience. Knowing your audience helps you as a storyteller, of course. But as a data scientist, you need to think of it along a couple of dimensions. First, when creating the story that you're going to tell with your data, is your audience knowledgeable of data



science, statistics, and things like that? How much so? Are they people like you, people with graduate degrees in data sciences? Or are they completely unaware, daresay illiterate, maybe members of the general public? Their data science, what we call literacy, may impact how you tell your story. Second, is your audience knowledgeable of the data that you're using? Do they know what it contains, what it omits, and why? These two dimensions matter, because as a storyteller, you're responsible for creating a world where your story exists. Lots of stories we know are in worlds that we understand. They're all around us. But others, thinking of like, say, science fiction and fantasy, go to great lengths to teach the viewer about that world. In essence, making them literate of the world of the story. So thinking of the audience, recall the introduction to the film Star Wars, the original one. Scrolling long ago, in a galaxy far, far away. That explained a whole new world for us. If you weren't familiar with Star Wars or science fiction, as long as you read those opening credits and weren't late for the movie, you had the general gist of what was going on in that world. The data you use to tell stories is a large part of that world and it behooves you to make sure your audience understands your world. The second point we look at is what we call the armature. Now, every great story has a point. A takeaway for the audience. What will they remember? Think of your favorite story. What was the point of that story? The story consultant to Pixar, Lucas, and others, Brian McDonald, calls this an armature. The turn comes from special effects and sculpture. Where every great sculpture has a hidden scaffolding. A structure which supports what you see as an observer of that sculpture. Others call this theme and other things. But I prefer armature, because it's much more to the point. Theme I think is too broad. So when thinking of stories that have a point, what are some examples? The classic ones I think of are Aesop's Fables. There's always a moral, a takeaway for the audience. One I like to use is, remember the story of the tortoise and the hare. You already know the point of it, right? But let's think through it, right? So there's a race between a tortoise and a hare, who are relatively slow and fast, respectively. We think the hare is going to win, because he races ahead. But then he takes a nap and he's confident that he'll beat the slow tortoise. But the tortoise keeps plodding along. And when the hare awakens, he realizes the tortoise has already won. So the armature, or the takeaway for the audience, slow, determined, and steady wins the race. It's as simple as that. Bringing to close on armature. Every great story has an armature, a central, key point of the story. They teach you something as the story observer or the viewer. They don't necessarily need to be moralistic, like with Aesop's Fables, but it needs to be that one, single takeaway. They're important because everything else in the story, the structure, hangs from that armature that you create as a storyteller. Let's now look at story structure. We're often familiar with the five act play. Think of Shakespeare. Oftentimes, there's also the three act play. People will toss around words like climax, rising action, falling action. Don't worry about them. It gets too complicated. And it over focuses on one exciting or interesting part of the story. Maybe an exciting climax, a

chase scene, an aha moment. But that's wrong. It doesn't mean the whole story is good. I'll bet you can think of a story which has one really, really great part, but the rest of it wasn't as good. And you maybe don't even remember it. It's not really a great story. So when telling a story, you need to focus on the whole story itself. And here's how. We're going to go back to story consultant Brian McDonald's ideas for how to tell stories. He takes the familiar, three act format which we know, and offers instead essentially three, easy, seven steps to follow. That's it. So you take your armature, the point of your story, and use these steps to tell the story. So here it is. One. Once upon a time. Two. And everyday. Three. Until one day. Four. And because of this. Five. And because of this. You can repeat four and five. Six, until finally. And then seven. And ever since that day. That's it. That's how you tell a story. It's as simple as that. Now some people are really going to want to try and map this to the three act format. And I've done that for you here. Act One. Once upon a time and every day until one day. And then act two, the bulk of the story, oftentimes, and because of this, and because of this. That repeats. And then, Act Three. Until finally. And then ever since that day. By following these steps, you'll better ensure you're creating a story that is both recognizable and memorable to your audience. It won't be predictable, necessarily, as that would be boring, but the audience will understand where you're going and they'll trust that you'll actually take them there.

## 11.7. Tell a Good Story, Part 3

So let's bring it all together-- audience, armature, and structure-- for a familiar story and one of my favorites from arguably the best storytellers out there-- Pixar's Toy Story 2. First, who's the audience? We might first think children-- it's an animated film-- or children and parents. Parents take their kids to animated films. People without children, maybe just animation fans, Pixar fans, Disney fans-- huge, immense audience. But really, it's actually anyone who's ever actually had a toy. That's the point of this film. That's the audience. Next, let's look at what the armature is. What is the takeaway? Do toys come alive when we're away? No. Toy collectors are creepy? No. Cutting to it, we all long to be wanted by someone. That's the point of Toy Story 2. Now, what's the structure? Let's take you through this real quick. So act one-- once upon a time, there lived some toys in a boy's room, toys we've all had growing up. You can recognize what they are. They play with one another whenever a human isn't around, and the leader of the toys is named Woody, and he's a cowboy. And every day, they play with one another and Andy, who's their owner-- act one again-- until finally-- until one day, excuse me-- Woody's arm gets ripped, and Andy decides that he's a broken toy. Andy then doesn't take him to cowboy camp, making Woody think he's no longer wanted by Andy. Andy's mom then holds a garage sale, and the toys see Woody, while attempting to rescue another broken toy, is stolen by a shady-looking man. We now go into act two. And because of this, Woody is taken to the man's house-- the guy actually happens to turn

out to be a toy collector-- where then, Woody learns that he's the star of a TV show from the 1950s and incredibly valuable. He meets other toys from the show-- Jessie the cowgirl, Stinky Pete the prospector, and his own horse, Bullseye. Woody had no idea this world existed. We learn that the toy collector then plans to sell them all to the museum, where they'll actually never be played with, instead just observed. Continuing in act two-- and because of this, led by Buzz Lightyear, the toys search for Woody, taking them to the toy collector's toy store and eventually his home. The toys find Woody, but he won't come home with them. The old prospector and Jessie have convinced him that Andy no longer wants him. Jessie was once given away and abandoned by a little girl-- doesn't want that to happen again-- now turning to act three-- until finally, Woody recognizes that it's better to go back to Andy and maybe be wanted and played with than to never be played with at all, and he changes his mind. But Pete stops their escape, and the collector returns to take them to the museum. He packages them up, heads to the airport with Woody and the TV show toys in tow, and Andy's toys are in hot pursuit. Woody and Bullseye escape, but Jessie is on the airplane with the collector. Woody convinces her that Andy's sister will want her, and they make their escape just before the airplane takes off. Woody, Jessie, and Bullseye and the other toys return home to Andy, who's excited to see them. And ever since that day, the toys are all played with by Andy, including Jessie, who's played with by Andy's younger sister, Molly. Now, Toy Story 2 is great because of a couple of things. One, the armature-- we all want to be wanted by someone, whether it's a partner, whether it's a family member or a pet. It's universal. Second, the audience-- everyone-- we've all had a special toy or a special thing that's meant a lot to us, and maybe we don't have it anymore. Third, the structure-- as you saw, there is an incredible lot packed into the story, but it maps to the seven steps, and every single scene is therefore a reason. So let's look at four takeaways from this. Why did we deconstruct a film and look at it in this way? Well, it helps first-- know your audience. Second, make certain you have a point for that audience, which we call the armature of your story. Third, recall thinking of your structure of your story as having seven steps. Brian McDonald shared with us. And fourth, the takeaway of this, is pitch the story that you want to tell. Now, every single candidate film at Pixar and many other film production houses-- first, the story is written and then delivered by a storyteller as a short pitch, oftentimes 2 and 1/2, 3, maybe 4 minutes. They act out the entire, whole story themselves. Before anything is really written down, anything is drawn, any incredible amount of work is, can we tell the story in three minutes? And can you get the audience, the armature, and the structure conveyed? They all should be apparent on the pitch. There should be no extra explaining going on. If not, that means that the story isn't good, so you have to go back to writing. You repeat this over and over and over until you actually get a good story, and only then do you start creating the imagery, writing the script. That's how you end up with a good, or even great, story.

## 11.8 External and Internal Elements of a Story

- Brian McDonald's *Invisible Ink* presents one of various narrative structures you may engage when you communicate with your audience.
- In chapter 5, he talks about external and internal elements of a story.
- I acknowledge that the masculine and feminine way he describes a balanced story reinforces gender stereotypes.
  - And I find this problematic.
- In this section of Chapter 5, I encourage you to focus on how a mix of external and internal elements contribute to a compelling and memorable story.
- For example, let's say you describe the data component of a project that wants to better understand how surgeons interact with the medical equipment your company produces.
  - An external element of the story may be a description of the data generating process. Or pattern that emerge from the log data that is collected during every surgery.
  - An internal element of the story may be a discussion about the humans behind the data.
    - You may choose a few anecdotes to articulate what these data points capture. The nuance or the risk of each procedure.
      - Or, you might talk about you surveys or interviews with surgeons about how they engage with the equipment, and its impact on the stress levels in the operating room.
- If you balance the external and internal, your story will have greater impact.

## 11.9 Storytelling in Herman Miller

Interview with **Marilyn Walton**

This element addresses the following learning objective of this course:

- LO5: Identify the audience and the most effective method to communicate a persuasive argument.

Marilyn Walton from Herman Miller. Marilyn, you're in a somewhat traditional design-driven firm that makes office furniture and many other things. But that's sort of the basis of the foundation. Tell us a little bit about your use of storytelling and your interaction with data and designers and how that's seen from the perspective of Herman Miller, particularly when you guys think about talking to your clients about their future needs.

Yeah, so there's really a couple of things there. One has to do with how-- well, let me talk about our culture first because our culture is one truly of innovation, design. And as you can well imagine, because of that, we're probably not a real data-driven company. And we are probably more into storytelling. And storytelling has been part of our culture. It's part of our history. We tell stories all the time about our history. And so I think it just then evolves into how we do business on an everyday basis.

And I'm part of a group called Insight and Exploration, which is in the umbrella of research and development at Herman Miller. And so a lot of the work that we do does inform new product development. We do work with industrial designers. We work with specific project teams. And I guess one thing I'd like to say is that over the years, it's been interesting how the use of research has changed and has evolved into-- I guess I would say more storytelling.

It used to be that the research group, Insight and Exploration, is just our nice word for research. But the research group used to be asked by maybe a project team to do research. And the project team might include an industrial designer. And that research was covered by that team. They didn't want anybody else to hear it. It was kept close.

And there was really not much storytelling involved with it. It was just here. We didn't even make recommendations or try to involve people in discussion. It was just kind of here's the facts. And I think over time--

Marilyn, would that typically be aimed at a very specific need, perceived need, on the part of the team? Did they already have a sense in their heads of what it is that they wanted you to know?

Yes, yes. And so oftentimes, I think that some of the researchers would say that then what happened was that research would be-- they would share the research. It would be put on a shelf some-- nothing else happened with it. So there was no broadening of the research. There was no connecting the dots between different pieces of research. And it was, like I said, kept to just that project team.

Then over time, what's happened is that there is this demand by our customers and by other parts of the organization to knowledge is power. And that research is really important. And so it's become almost mandatory that we figure out a way. If it's not too telling of what we're going to be doing or negative about something that we've been working on, then we more often than not try to figure out a way to share it very broadly so with our customers because they're interested in probably a lot of the same research.

A lot of the work that I do is [? the ?] scenario work and sharing the scenarios with customers. And that's not, at least the way we do scenarios, it's not real-- it's not quantitative. It's storytelling. And it's more conversation and discussion that we try to share with clients. There are some clients whose eyes glaze over with that approach, I have to admit.

I mean, there's either people that can think about the future and want to get into a discussion, and there's others that are just like that's not their cup of tea. And if I run into that kind of an audience, I guess at that point, I really-- I try to engage them in discussion in some way to understand where they're coming from and engage with them in some way. But--

Are they-- do you ever engage with people in that context on a question like, OK, let's imagine-- so you present a set of scenarios about how the future of the workplace might evolve. And it would-- I can imagine very easily someone on the other side in a data-driven organization might say, we don't have the data to collect. We don't have the data to understand that kind of evolution.

Or we're not collecting the right kind of data to bring us to a better understanding of that world. Do you ever get into that kind of conversation where you can work together to figure out, well, what data should we be collecting to see if that kind of world is evolving and understand it better or at least be less ignorant about it as it starts to emerge?

No, I'm sorry. I can't-- I don't get into that kind of a situation. Typically, we do try to vet the kinds of customers that we share the scenario with. And we have a list of things that we give to our salespeople around here's the kind of audience that is going to be most interested in this work. But I will say the one way that it has evolved, and it's our third round of scenarios, one way that that interaction with customers has evolved is that we got a lot of what the first time around.

We would share it with customers. And they would-- they might not say it directly to us. But they might say to the salesperson after we walked out of the room, so what? What does that mean? Because the stories themselves are-- they're interesting stories. And

then we develop the propositions around how work will change. And what we didn't do initially was then connect it to them, so connect it to the workplace.

So it might be a very general statement about work. But as soon as we start to say, and this is what we do today, imagine in 2018 that your workplace da, da, da, da, da. And then they start to connect with it. And they go, oh, well, it could evolve in this way too. Whereas if you don't start to lead them down that path of imagination in 2018, which is kind of storytelling, then they can't get there so easily.

Well, one of the things we're hoping the graduates from our program will be able to do is actually engage in precisely those kinds of conversations. Imagine that workplace in 2018. Let's think about what people are doing. Let's think about the nature of demand for different kinds of products.

But in addition, let's think about the kinds of data that would be really valuable to collect in that setting and get ahead of that game a little bit. And I think that would be an interesting conversation to have as well. I know it's a hard one. But as the cultures evolve, you can hope that they would come a little bit closer and be able to engage in stuff like that.

Right, so what you're saying is the customer is starting to say or together starting to talk about what data would really help prove that?

Yeah, or even understand it as it starts to emerge. Almost looking back, we're looking back from 2018 and saying that, wow, it would have been really useful in 2015 for us to have had data on this set of phenomena or these people or these kinds of places because it would have updated us more efficiently on how the direction in that scenario was evolving.

Right, so one of the things that we do and-- a couple of things. One of the things that we do do is share evidence. So we have the stories themselves. And then we develop the propositions around how work will change because our stories are really pretty contextual. So then we-- from that, we develop these propositions around how work will change.

The other piece that we give them in addition to the image in 2018 is some of the evidence that we see happening today. So as an example, when we talk about hackable and kinetic nodes being the way people work in the future, we give them examples like pop-up stores, pop-up retail stores, hackerspaces, or those kinds of things. And if we have data that we can share with them in terms of how many of those things are happening, then we do share that with them.

What we're starting to embark on right now is, in the research group, taking some of the learnings and saying, we need to do some deeper dive research into it. So I think that's what you're talking about really-- and it would be interesting to engage with customers and say, what would really make you-- what data would be useful to really make you believe in this particular proposition?

## 11.10 Insights From Pixar, Part 1

In the next few segments, we're going to take advantage of a local Berkeley resource (or at least, an Emeryville resource, right next door) and spend some time with Ralph Guggenheim, a master storyteller who is responsible (at least in part) for a great deal of the animation studio Pixar's success. Because animation can't rely on the usual great actors and bankable stars to create great stories in and of themselves, animators are often the very best storytellers in the entertainment industry. We think data scientists can learn a great deal from what they know.

This element addresses the following learning objective of this course:

- LO5: Identify the audience and the most effective method to communicate a persuasive argument.

In this unit, we're focusing on storytelling and how data scientists can use storytelling to convey findings to various audiences. With us today is Ralph Guggenheim, the CEO of Alligator Planet, who provides consulting and production services to the animation industry. Let's welcome, Ralph.

How are you doing today, Andy?

Good. Thank you for joining us.

Good.

I just want to jump in a little bit. Can you describe a little bit of your background and the role you play in the broader world of storytelling?

Sure. I became interested in filmmaking back in high school and going-- studying it in college at Carnegie Mellon, I was really interested in making films at a school that had no film department. But I did discover that there was this thing called computer animation that was in its nascent stages, and got involved in the computer science department there and started making films using computers.

And along the way, that led to a graduate degree there and then ultimately a stint at



New York Institute of Technology. And from there, a bunch of us were recruited in around 1979, 1980 to come out to Lucasfilm here in California, where we started a computer research group for George Lucas to create new techniques for the film industry, for filmmaking.

After working in that for several years, one of the groups spun off and formed a company called Pixar. And Pixar actually was not started as an animation company. That was something we did on the side. It was a computer hardware company.

Animation took off. Hardware didn't. And the rest is, as we know, history.

Excellent. So we focus in our class-- we talk about storytelling and so forth. With the frame of our students as data scientists, we'll be running research projects and experiments and gathering data and having findings that they would like to convey to various sorts of audiences, which is often like a business audience, which could be different from a popular culture audience familiar with films and things like that. Can you kind of talk about your experience, if you've worked in that space, or how do you tell a story to a business type of audience, let's say?

Right. So you know, it's curious. Because early in my career I was making industrial and educational films, some for Carnegie Mellon University, some for outside organizations. And so I would spend a lot of my time working with scientists who were doing computer research in things like speech understanding or computer chess and things like that.

And my job really was to just hang with them for some period of time and read some of their research papers and talk to them about what they were doing until finally I understood what it was all about. And at that point, I would draft a screenplay around what it was that they were doing that was groundbreaking, because if I could explain it, then I could make a film about it and they could get research money to help them do it better, because the people they were applying to for grants, they wanted to use these films to help get grant money. And they needed a film that could explain very clearly and succinctly to non-technical people or people not in that specific area what it was that their research was all about.

I then diverted into the more conventional world of fictional storytelling and animation, and deepened a lot of my understanding of what that's all about. And now recently, I've been back working more in the world of how to help businesses tell their stories, particularly working with start-ups and entrepreneurs. And so it feels like what's old is new again. It's come full circle, but the problems remain the same whether you're doing entertainment or whether you're trying to communicate nonfiction. It's a very similar problem.

Can you say more just about what those problems are?

The problems really are that what-- and this applies everywhere. It applies in narrative filmmaking and it applies in educational filmmaking. And that is what is in the creator's head or the storyteller's head isn't always told in the sequence in which the audience wants to hear about it. And so it's about convincing people to get out of their head and to look at it from an objective point of view of an audience member and figure out how best to tell the story that will be entertaining, moving, emotional, or just in fact informational to that audience.

That sounds like it might take a fair amount of skill. We've been working on some of our curriculum with students and can follow certain steps to help them kind of craft stories. And what you're imparting, it almost sounds more like a wisdom of the experience, of moving from just the standard of a "once upon a time" style and format and coming to what you would call a climax and a resolution and so forth, which can be almost mechanical. But it seems more of like an art form it sounds like you've developed over time in how to convey a story.

Well, admittedly, the real art form is more for people who are doing narrative storytelling in entertainment. It's not all that complicated in doing it for business or scientific purposes. But you can learn a lot from the way narrative storytelling is done. And like you say, yeah, you have your basic steps. You have your definition of a problem. You have a-- I mean, look at any movie.

So traditional screenwriting structure is broken down-- or story structure, dating back to Aristotle, is broken down into three acts. Act 1, you have a character, a person, a purpose, a project, whatever you want to call it. And there's a problem that they encounter. Act 2, overcoming a series of obstacles, usually ever-increasing obstacles that make it more and more difficult for that character, until finally you reach the point where the character hatches a strategy or a plan, and in Act 3 puts that into motion and prevails.

So how do we apply that to business or scientific storytelling? Well, businesses and scientists have problems that they're trying to solve. So rather than what we usually see is people who are not trained in storytelling will get up and say, first I did this, then I did that, and then I did the next thing. But that's not always the most interesting way to tell your story.

Perhaps what we can learn-- and yes, perhaps there's wisdom involved in this, but it's not very hard to figure out what the wisdom is, because storytelling is all around us. So we go to movies, we go to plays, we watch television, the same structural three-act

format is played back over and over and over again all through our lives. And it's not hard to learn from that.

So you start by saying, here's the problem that I encountered one day. I was brushing my teeth and I thought, why do I have to use this stick with some bristles on it? Perhaps I could invent something better.

And that led me on a quest through various obstacles and various problems I had to solve to invent a better toothbrush. And ultimately, I came upon a strategy and a plan on how to do it that was going to be better. And lo and behold, the world beat a path to my door to use my new invention.

Yeah.

So it's not hard to think about and formulate stories in that manner. In working with entrepreneurs, we talk a lot about value propositions. And so what's the value proposition? Well, it's not about making a better toothbrush, in fact.

And that's, again, what scientists and engineers and businesspeople always think is that-- I just heard someone pitching their idea for a new investment idea that was socially responsible investing. But the way they started was, first I worked at a bank. Then I worked at an investment house.

But that's not the value proposition. The value proposition is, wouldn't you like to be able to change the world in the way in which you invest your money? Has nothing to do with banks, has nothing to do with capital--

Where they came from.

--or what your return is going to be. It's wouldn't you want to change the world? And that's something that people who are not trained in storytelling need to understand, particularly if they are working in the world of entrepreneurship or business or science, is thinking about what the value is that they're really creating. That's often the starting point or what we call the inciting incident in screenplays. That's the starting point for a good story. And then you move on from there.

Excellent. So for someone who is very well versed in, say, technical skills and science and things like that, and has these aspirations to become a great storyteller, we talk in our class about processes that they can follow and so forth. But what are the other things that they can maybe look for inspiration to be able to get this sort of experience in their life, just to become a better storyteller over time, because it's probably not something-- you don't just become a great storyteller. It's a craft you have to probably develop. How would you do that?

It's not hard to become a good storyteller. And not many people are great storytellers. In fact, if you look at the number of films that do well at the box office, the numbers that do poorly, you recognize that there are a lot of people who are not great storytellers. There's very few who are great.

But to be a good storyteller is not difficult. And to be a good storyteller is simply, number one, understanding and having passion for what it is that you're trying to communicate. And that's not hard for people who are researchers or entrepreneurs, because they usually have great passion for what they're doing.

And number two is getting outside of yourself and thinking about how people can best learn or come to understand the story that you want to tell. And again, it's that objectivity. You have to get away from the subjective point of view and be more objective about it. And think of yourself in part as an entertainer, that you're going to be talking to an audience and you're going to explain to them how it is or what it is that you're doing.

We've been talking about storytelling, and I'd love to know, what is your favorite story, if you had one, or a couple?

I really don't have a favorite story.

Yeah. I have a favorite genre of story.

OK.

And my favorite genre of story, I don't even know if it really has a name. It's funny, because years ago-- I wish I could remember his name now. Years ago, I met a professor at Berkeley who actually was a professor of folklore. And he would say-- he asked me the same question. What are your favorite stories?

Yeah.

And I said, well, you know think about Hansel and Gretel. He says, oh, number 487. And I said, 487?

And I said, or what about Cinderella? Oh, number 375. And it turned out that he was a co-editor of a series of volumes on all the archetypal story genres in folk literature. And they had enumerated them, so Cinderella was number 387 and Hansel and Gretel was number 485 and The Cobbler and The Elves was number 362, and then all the variations within them, depending on what culture they came out of were there.

So I don't even know if there's a name for my favorite genre of story. But my favorite genre is sort of what I would call the Magic Christian story. And the Magic Christian story is when somebody arrives out of nowhere and creates havoc or brings benefits or change to the people that he or she encounters along the way. So it's a story genre that has been played out many times in many different films, some obscure ones, some fairly well known ones.

Recently there was a series on HBO that unfortunately didn't last very long called John from Cincinnati. John from Cincinnati was exactly this. A guy shows up from out of nowhere in a beach town in Southern California and creates change through all the people. Does he have special powers? Does he have-- it's never very clear. Unfortunately, the series was canceled after one season, so we never really found out who John was.

But it was that kind of a story. And I've always found that kind of story very entertaining and very endearing for me personally and very emotional.

Is there anything you think our students should know as data scientists who are learning to become storytellers, who might be very good storytellers, will become great storytellers? Is there anything else from your experience that you think they should know that we haven't covered?

Not really. I think it's just about being observant of the varieties of stories and how they're built that come at you every day of the week. And it could be what a friend tells you over coffee at lunch. It could be what you see on television or in a film. And it could be the simple understanding that every story really just simply needs a beginning, a middle, and an end, and that's all there is to it.

And the rest is, let your passion drive how you tell your story. But let your passion drive it in a way that informs your audience primarily, not just you.

Great. Thank you. Let's think of Ralph for being with us today and sharing his insights on being a storyteller.

Thank you.

Thanks.

## 11.11 Insights From Pixar, Part 2

So far in this unit, we've learned the importance of storytelling in our work, as well as tips to help create great stories. Building on what we've learned about audience, armature, and structure, we'll now focus on additional tips to help the storytelling process. Some of these come to us from a former storyboard artist at Pixar, and these are the 22 rules and they'll help you craft a great story. We'll also discuss traps that storytellers encounter, one being the perils of having movie star quality data and the perils and challenges that can pose and the importance of being honest with your audience.

## 11.12

### 11.12.1 Insights From Pixar, Part 3

Here is a text version of Pixar's 22 storytelling rules. Please read them *carefully*, and let them sink into your thinking. Keep asking yourself, how would I apply this rule to a data-enabled story? What would that look like if I were a Pixar writer *as well as a data scientist*?

From Emma Coats, a former Pixar story artist:

1. You admire a character for trying more than for their successes. 2. Keep in mind what's interesting to you as an audience member, not what's fun to do as a writer (they can be very different).
3. Trying to theme is important, but you won't see what the story is actually about until you're at the end of it; now rewrite the story.
4. Once upon a time there was \_\_\_\_\_. And every day, \_\_\_\_\_. One day \_\_\_\_\_. Because of that, \_\_\_\_\_. Because of that, \_\_\_\_\_. Until finally, \_\_\_\_\_.
5. Simplify. Focus. Combine characters. Hop over detours. You'll feel like you're losing valuable stuff, but it sets you free.
6. What is your character good at; comfortable with? Throw the polar opposite at them. Challenge them. How do they deal?
7. Come up with your ending before you figure out your middle. Endings are hard; get yours working up front.
8. Finish your story; let go of it even if it's not perfect. Move on, and do better next time.
9. When you're stuck, make a list of what wouldn't happen next; often the material to get you unstuck will show up.
10. Pull apart the stories you like. What you like in them is a part of you; you've got to recognize it before you can use it.
11. Putting it on paper lets you start fixing it. If it stays in your head a perfect idea,

you'll never share it with anyone.

12. Discount the first thing that comes to mind, and the second, third, fourth, fifth. Get the obvious out of the way, and surprise yourself.
13. Give your characters opinions. Passive/malleable might seem likable to you as you write, but it's poison to the audience.
14. Why must you tell this story? What's the belief that your story feeds off of? That's the heart of it.
15. If you were your character, in this situation, how would you feel? Honesty lends credibility to unbelievable situations.
16. What are the stakes? Give us reason to root for the character. What happens if they don't succeed? Stack the odds against the character.
17. No work is ever wasted. If it's not working, let go and move on; it'll come back around to be useful later.
18. You have to know yourself and know the difference between doing your best and fussing (story is testing, not refining).
19. Coincidences to get characters into trouble are great; coincidences to get them out of it are cheating.
20. Exercise: Take the building blocks of a movie you dislike. How would you rearrange them into something you do like?
21. You have to identify with your situation/characters; you can't just write something "cool." What would make you act that way?
22. What's the essence of your story? The most economical telling of it? If you know that, you can build out from there.

This element addresses the following learning objective of this course:

- LO5: Identify the audience and the most effective method to communicate a persuasive argument.

## 11.12.2 Review of Pixar Insights

This element addresses the following learning objective of this course:

LO5: Identify the audience and the most effective method to communicate a persuasive argument.

OK, so you've had a chance now to read through and, hopefully, think a little bit about the 22 rules of Pixar storytelling. All of them, I mean 22 rules is a lot. All of

them are useful. Let's acknowledge that some of those rules-- or maybe guidance is better than rules-- some are more immediately applicable to the data science world than others. So I want to reflect on just a couple of them in particular and try to cement them into our heads, hopefully, forever because they're actually really useful. So let's focus on just a couple.

First, I think it's rule number 11. They say, putting it on paper lets you start fixing it. Putting it on paper let's you start fixing it. I think this is actually a very useful rule to keep in mind. Everybody does this in their own way. Paper doesn't always mean paper. I like to use a short slide deck. Some people like to draw storyboards. I have friends that use a big piece of butcher paper and draw a timeline on the paper. I don't think it really matters. I think the point is to find what works for you but never, ever skip this stage.

And the reason for that is that people who are listening are essentially, either consciously or unconsciously, they're reconstructing some kind of visual representation on paper as it were inside their heads. And so if you don't do that to start, as you think about how you're going to develop and construct the story, they're going to have a hard time doing it as listeners. And actually, it's your job to make that job for them much easier. So put it on paper and then start fixing it.

Here's a second rule that I think is worth paying attention to, and this is, I believe, number 12. Rule number 12 is discount what first comes to mind. Now this is sort of like the opposite advice that people give you about intuition and betting. Unlike intuition in betting where it turns out your first instinct is often right, the first idea for storytelling is almost never the best. When you write it down the first time, you write it down. That's great.

One way to experiment with this is write that down and then put it in a folder or drawer. Put it away and try something completely different. And do that a couple of times. Now, of course, I think it's actually very useful to keep a record of where you started and where you naturally went. There's a lot to learn from that evolution over time. You'll start to see your own storytelling tendencies, and you'll be able to skip wasted steps as you go forward and do it again and again. But I think you'll discover, as I have, as almost everybody I know who writes narrative has, that the first idea is almost never the best idea.



Third, and actually third and fourth rule that's worth keeping in mind. Number 10, Pixar says pull apart the stories you like. And number 20 says pull apart the stories you don't like. And I think this is actually, again, really, really good advice. It's basically paying attention to the experience that you have as a reader or a listener with other people's stories

And in fact, you can do this all day long. You can get better at it over time, just in the course of day-to-day interaction, like when your friend tells you a story about what happened to her at work yesterday or when you read a newspaper article or even when you read a scientific journal.

What we're asking for here, what the Pixar people are really saying is don't just pay attention to the content, and the argument, and the evidence. Stay aware and mindful of some of your own experience of the story as a consumer and then go back and ask yourself at the end, what did I really like about the way that argument was presented, and what did I not like? For me, personally, where was my attention engaged, and where did my attention start to drift?

It's kind of a way of asking, everybody always uses the word make a compelling presentation, do a compelling argument. What does compelling mean for you in practice? And I think the more that we come to understand that about ourselves, what compelling actually means for us as a simple experience, the more easily we'll be able to create compelling experiences for other people. It seems obvious, but we actually don't do it as much as we should.

And, finally, the last and most important rule, I think, is number three on Pixar's list. And they put it this way. Trying for theme is important, but you won't actually see what the story is till you're at the end of it. Now go back and rewrite it.

So look, in the data science world, or any scientific endeavor, I think this is really, really, really critical to remember. When you come to present your results to somebody, you usually start with your finding. You start with your argument. You might start with your data product. You have spent months, years, who knows, getting to that result. You have an idea what that means. Now you want your users,

your readers, your bosses to learn from it. That's the theme.

You're going to construct a narrative. You'll write it down. Maybe you'll put together a slide deck. Maybe you'll write a memo. Maybe you'll write a scientific paper. And then, when it's over, typically you write the conclusion. That's the last slide, the last paragraph, or the last section of the paper. And here's what scientific writers almost never do. They never go back and rewrite the paper after the conclusion is done. And this is what Pixar says you should do, and I agree with it.

After that's completed, start from the bottom. Go back and read that final slide or that final paragraph and keep in mind that's the payoff. Now go back to the beginning of the paper, the beginning of the presentation, whatever it is, and rewrite everything else, if necessary, so that it works with and contributes to that payoff.

Now, for most people, I mean this really hurts. I was taught this by my dissertation advisor who once said, the logic of discovery is not the logic of presentation. Most people don't want to go through the same exacting, difficult process that you did to actually get to the finding. So that means rewriting it for the logical presentation, and that really hurts. Someone I know once called this killing your children. And I know I've had experiences that kind of feels like that. But the fact is, you got to do it anyway.

And look, I think that actually makes sense when you remind yourself that the point of the data product is to change somebody's mind with a story. And so, with that kind of, I guess, optimistic lesson about how great it is to kill your own children, let's go back to Andy for a few thoughts on storytelling pitfalls, some things that we really want to avoid.

## **11.13 Let's Focus on a Few Rules**

This element addresses the following learning objective of this course:

- LO5: Identify the audience and the most effective method to communicate a persuasive argument.

We now turn to Pixar for additional thoughts on creating great stories. These come in the form of the 22 rules, which made the rounds on the internet a while back. And they came from Emma Coats, a former Pixar story artist. For background, a story artist transforms a story pitch into a visual version. These images are used to further explore story armature and structure as well as help guide animators. We're going to step through these 22 rules. What I'd like you to do is make a note of which ones you think most apply to you as a data scientist while telling stories. After reviewing the whole list, we'll dive into a handful that we think are most relevant. Let's start from the top.

One, you admire a character for trying more than for their successes.

Two, you got to keep in mind what's interesting to you, as an audience, not what's fun to do as a writer. They can be very different.

Three, trying for a theme is important, but you won't see what the story is actually about until you're at the end of it. Now rewrite the story.

Four, once upon a time there was-- and every day-- one day-- and then because of that-- and until finally. You might recognize that one.

Five-- simplify. Focus. Combine characters. Hop over detours. You'll feel like you're losing valuable stuff, but it sets you free.

Rule six, what is your character good at? What are they comfortable with? Throw the polar opposite at them. Challenge them. How do they deal with that situation?

Rule seven, come up with your ending before you figure out your middle. Seriously. Endings are really hard. Get yours working upfront.

Rule eight, finish your story. Let go. Even if it's not perfect. In an ideal world, you have both, but move on. Do better next time.

Rule nine, when stuck, make a list of what wouldn't happen next. Lots of times the material you get to will unstuck, and will help you out.

Rule 10, pull apart the stories you like. What you like about them is a part of you. You've got to recognize it before you can use it.

11, putting it on paper lets you start fixing it. If it stays in your head, a perfect idea, you'll

never share it with anyone.

Rule 12, discount the first thing that comes to mind, and the second, and the third, and the fourth, and the fifth. Get all the obvious stuff out of the way and surprise yourself.

Rule 13, give your characters opinions. Passive, malleable might seem applicable to you, as you write, but it's poison to the audience.

14, why must you tell this story? What's the belief burning within you that your story feeds off of, and that's the heart of it.

15, if you were your character in this situation, how would you feel? Honesty lends credibility to unbelievable situations.

16, what are the stakes? Give us a reason to root for the character? What happens if they don't succeed? Stack the odds against the character.

17, recall that no work is ever wasted. If it's not working, let go, and move on. It'll come back, and you can use it, and it might be useful later.

18, you have to know yourself. The difference between doing your best and fussing. Story is testing, not refining.

Wrapping them up, number 19, coincidences to get characters into trouble are great. Coincidences to get them out of it, are cheating.

Number 20, exercise. Take the building blocks of a movie you dislike. How do you rearrange them into something that you do like?

Number 21, you've got to identify with your situation and characters. You can't just write-- think something's cool. What would make you act that way?

And 22, what's the essence of your story? What's the most economical and easy way of telling it? If you know that, you can build out from there.

So which of these rules apply to you as a data scientist? Let's focus on a couple-- number 4, number 11, 12, 10, and 20.

Number 4, we covered this first one. Once upon a time-- Brian McDonald's seven-step structure for telling a story.

Let's go to 11 and 12. 11-- putting it on paper lets you start fixing it. And 12, discount what first comes to mind.

Any time you're telling a story, write it down, draw it, record it, perform it. Do anything.

Then discount it, and try something else. Choosing your first idea really limits your options. Ask any storyteller. The great story evolved first from an idea that they tried out. Always keep a record of where you started so you can see and learn from that evolution.

10 and 20-- pull apart the stories you like as well as pull apart the stories you don't like. Next to the seven-step structure, these are, perhaps, the most important takeaways. Do like we've done in this lecture, essentially. Examine a story you like in any form-- film, print wherever. Figure out what makes it great. Why do you like it? And particularly do this for the stories that you don't like. What's it about the structure, the armature, or any other bit of that story that makes you not really like it.

We also want to touch in here too is what are some of the challenges and traps that you can run into as a storyteller? First, well, because of the temptation of getting starstruck. We've all seen the movie with a big star where the story wasn't any good. Second-- the trap of not being truthful with your audience. Stories can be surprising, but they must be honest. And it's really easy to lie with data. The first one, the data being your star-- stars don't make good stories. Think of Hollywood. It's really easy to find an example. I'll pick on Johnny Depp, right? So he was great in the very first Pirates of the Caribbean film and many of his other earlier films, but less so in the later films, particularly in the Pirates of the Caribbean and even less so in The Lone Ranger. Why? It was the story. Casting is incredibly important, but it's not all of it. A star doesn't increase the odds of a good story. It will simply sell tickets.

The same is true for us when telling stories with data. Just because you have some rare interesting, maybe, exotic data, doesn't mean that your findings, your story, will be as interesting as that data itself, maybe short-term, just like in Hollywood, but not necessarily long-term. Now, people often clamor for the most exotic, rare, hard-to-find data thinking it's a must-have for the story. If I have this data, I can, then, tell a great story. That's not the case. Start with the data, the cast, essentially, that you have, and tell a great story. Then tell another great story. Turns out, when you become a great storyteller, you get access to even greater actors, and you can have a better cast. Prove that you can tell a story with the data that you have, and you'll probably increase the likelihood that you can get access to that great data.

Next, be truthful. It's really easy to stretch the truth adding a twist to a story in an attempt to make it better. But a good twist is expected by the audience. An unexpected and unrealistic twist isn't being honest with your audience. And it's easy to be dishonest when trying to persuade people, particularly with visualizations and when you're trying to tell stories. So let's do a couple examples of honesty. You recall in the film Moneyball, you have Bill Bean-- character-- is presented with the chance of moving from the Oakland Athletics, where he's the general manager, to the Boston Red Sox. And with it,

he'll get access to an incredible amount of money, both, to buy players as well as his own compensation. And do you remember what happens? We think he'll sign since we'll finally be able to compete and maybe win the World Series. But he passes on the offer since he'd be further from his daughter. That's honesty in telling a story. Another instance of honesty occurs in the film *Raiders of the Lost Ark*-- one of my favorites. Recall what Indiana Jones is confronted by the swordsman in the bizarre. Indy only has a gun, and the swordsman has this gigantic sword. And the crowd parts. And we wonder, what's Indy going to do? He just shoots him rather than fight. That's being honest. It's darkly comedic. But that's what the story or the audience wants. Just be honest with them. No one's going to fight the swordsman.

So wrapping up, we've looked at Pixar's 22 rules. And we've also focused on a handful that are most applicable to you, as a data scientist. We also focused on two traps that storytellers encounter. The first one-- a great star doesn't make a great story. Your data is the star. Just because it's great, rare, or exotic, your job may actually be harder as a storyteller. Second, storytellers need to be honest with their audience. That's hard with data since it's so easy to use it to persuade people. Persuasion is fine. But remember to always be honest with your audience when telling a story

## 11.14 Insights From Pixar, Part 5

Interview with **Ralph Guggenheim**

This element addresses the following learning objective of this course:

- LO5: Identify the audience and the most effective method to communicate a persuasive argument.

Who do you look to, you know, when you're looking around in the world of narrative film, even business and so forth? Who would you say are some of the great storytellers out there today? Or the great stories that are told?

Well, the great stories that are told are, to my mind, the classic stories. And these are the stories that go back to mythology, that come up through what we recognize today as fairy tales, Grimms' Fairy Tales or Aesop's fairy tales, but they have mythological foundations. And when you look at films that we all admire today, you can trace their roots back to that same culture and that same tradition. Those are the great storytellers.

I personally grew up with directors who were making movies out of the French New Wave and Italian cinema and German cinema, and these are a lot of the people who I

admire, as well some of the great American film directors who came out of the '40s and '50s. And so, you know, I couldn't even begin to name all of them. And today, there are many great storytellers, and there are many great films that are being made all the time that evoke this.

The trick is to embrace the tradition of storytelling. I mean, what makes a good storyteller great as often as not is to embrace the tradition of storytelling, and yet at the same time, surprise your audience in an unexpected way. So it's like, give me everything that I'm used to having heard or seen before, but tell it to me in a way that I don't expect.

OK.

And that's perhaps one of the demarcation points between good and great storytelling. And it's very hard to get to that unexpected level, because we grow up especially these days with so many stories. We're bombarded by stories and media and movies and

television and podcasts and endless streaming video that it's really hard to surprise audiences at some point.

Now that's on the entertainment side. But let's talk about the innovation side of the storytelling, right? Innovation is constantly about coming up with surprising new things that people haven't expected for, or deducing information out of data, which I know is the area that you're most interested in, that would lead to a surprising result. In essence, surprising the audience there is a lot easier than it is in traditional movies or television. And so if we could just harness storytelling to that, it should actually be very compelling and very evocative.

Yeah. Thinking about that surprise element, what is the relationship, say, with technology in enabling or hindering that?

You know, the example that I am most familiar with in terms of that is the founding and the development of our work at Pixar. And we were led by a number of people with John Lasseter in particular who was really the first director that we hired there.

Was always adamant that technology is all great, but you know, Toy Story, the first film we made, you know, could have been made with sock puppets, and we could have made it for about \$25 bucks, you know? We spent \$30 million and did it with some technology. Is it a better film for it?

Well, visually, it's a more interesting film. Is the story better for it? Not necessarily, because the underlying story is really what draws audiences in. The technology adds a

layer of entertainment value and enhancement to it. But if the story is not right, no amount of technology is going to save it.

And I think we can apply that to a lot of other areas today. This will be shown across the internet to a variety of people, and if the content isn't interesting, it doesn't matter how beautiful the lighting is, how valuable the microphone is that's above my head or any of these things. All that technology is great at enabling it, but they're just tools in the effort to tell that story.

Yeah. Reflecting-- I remember there was a quote from John Lasseter, who once-- I think it's, if I have this right-- "Art challenges the technology, and the technology inspires the art" of what you're going to do. And that sounds related.

Well, we worked very hard at Pixar to marry our technology crew with our art crew in a way that they did challenge each other, in fact. And that was one of the keys to success.

But at no time did we ever make decisions based on what was a better technology for the film. We only made decisions on what was a better story for the film.

Excellent.

## 11.15 Storytelling and Your Audience

Discussions Prompt

Spend five minutes on the following prompt:

One of the integral components to tell a good story is to know your audience.

- What does it mean to know your audience? Describe how you gauge your audience.
- How varied are your audiences?
- What are some challenges you encounter?

## 11.16 Story Helps Distill Insight

### 11.16.1 Decision Makers Are Often Non-Technical Experts

This element addresses the following learning objectives of this course:

- LO4: Justify an analytic approach that informs decision making.
- LO5:



Identify the audience and the most effective method to communicate a persuasive argument.

The way we distill insight in a presentation is very similar to the discussion section of an academic paper. After all the analytics, make it clear to your audience what we've learned from the study and how it could be applied to the current situation.

Similarly, we need the ability to communicate recommendations. We don't necessarily need to make the decision. We're probably not going to say this is the best option. But rather, we'll likely say something like these are the trade-offs of doing x versus doing y. These are the strengths and weaknesses of each choice.

Now, we understand that you may not know all the risks of each decision because you may not be a subject matter expert. And that's OK. But you have to know at least enough context to make recommendations. Otherwise, your recommendations may come across as tone deaf.

#### **11.16.2 Tell Them Three Times**

This element addresses the following learning objectives of this course:

LO4: Justify an analytic approach that informs decision making.

LO5: Identify the audience and the most effective method to communicate a persuasive argument.

There's a famous framework in speech writing that applies to how we could present and how we write. It goes like this. "Tell them what you're going to tell them, tell them, and then tell them what you told them."

Let's break this apart. "Tell them what you're going to tell them." This is the setup of your presentation or on your paper. It's the necessary background to get your audience into the right mindset so that they can understand the importance of what you're about to say. It's kind of like the "so what" or the "this is why it matters." Think of this as the punchline. "Tell them." This is the middle part. Here you lay out your argument.

"Tell them what you told them." This is where you clearly articulate the intended insight derived from your work. Perhaps it has been implied, but here you make it clear what we've learned and why it matters. Reiterate the important takeaways. Remember, "tell them what you're going to tell them, tell them, tell them what you told them." And the goal is to do this all while avoiding redundancy.