way it was developed, worked real well for that camera right there. Now I’m going somewhere else, maybe way far away, and I liked that property, but it’s not quite right for this new location. So I’m gonna build on this property and I’m gonna use it here. Now, person three a year later comes in, and they’re looking at these properties and one of the things they want to be able to do is say ok, they used it this way here, and they used it this was over here. Or maybe there’s some comments about how it works and why it was changed and why that modification was made. And I can learn from that. So now I’m gonna use it someplace else, and I can say ok, here’s how it worked over here and here’s how it worked over here. Here’s how I might expected to work in this place that I can modify it accordingly. So it’s important that I know that whole trace of where that property has been and how it’s been used. So we don’t want to lose any subversion. You can think of it as versioning and it’s important to keep all that. There’s one other thing, something that you said triggered something with me that I wanted to say while I was thinking about it. I mentioned that the biggest problem with the interface right now it’s that it’s in the language of computer science. I’m flippantly using this word property. The very first time I met with Dr. Gates, about this project, that was my first question, what is a property, what are you talking about? So I’m using the word property easily because we’ve been working on this now for two years. But that’s not a term that the scientists would call this thing of properties, they’re thinking about properties of the thing that you’re measuring and you guys are talking about data properties. You know, the data properties are related to the properties of the thing on the ground. But I had to clarify that, I didn’t know, what she was talking about.

Dr. Gates: A data dictionary moment.

Student: What do you mean by data properties, are those like rules or how would you define them?

Dr. Pennington: How would I define data properties?

Student: yeah, are they the rules that you when once you go into the sensor and you pull in that information, is data property the rule you set up to be able to find what’s useful in that information, or how is that set up?

Dr. Pennington: I don’t understand your question, so I’ll give you an example to see if that clarifies for you. I have a sensor I’m measuring temperature of something the air or the ground or something, the temperature, the actual temperature measurement is a property of what ever it is I’m measuring, the entity I’m measuring. So I have the measurement and the actual entity and it’s a property of the entity. But when I’m doing data properties, the way were talking about it, I’m going to say during this time period at this place, temperature should range from 10 to 30. So now your talking about the property of the data stream, not the property of the thing I’m measuring. That’s a subtle difference but its one that’s not immediately obvious to the scientist when your talking about it. Did that help at all.

Student: So for that you’re talking more data constraints versus data actual data of information

Dr. Pennington: Right, yeah, yeah

Dr. Gates: So the anomalies come. Its like predicting what you think that the data--how it would be behaving, or what the measurements are in relationship to [the data].

Dr. Pennington: And its comparing the data, you know you’re you’re the data, the data is now the entity of interest, as apposed to the thing your measuring being entity of interest. A subtle but important distinction.

Student: Going back to what Adam was saying earlier, about trends or anything else you want to be able to predict that this just constraints all in properties to constrains that mention anomalies.

Dr. Pennington: um yeah, yeah, yeah

Student: So when defining, the user are able to define the data properties

Dr. Pennington: the users are the ones defining the data properties, yes

Student: and when defining them you have to take the weather into consideration?

Dr. Pennington: Something is not right about your question. The weather is what you’re measuring, in most cases. You’re measuring temperature, precipitation, and wind velocity. Those are what your measuring, and collecting data about. So the properties are about what you expect.

Dr. Gates: What you expected, how you expect weather to behave. And when you see a spike, you want to see when that spike occurs-- maybe the temperature raises, and you’re not expecting that. So its April and you don’t except to have a snow storm, and when that happens you want to be able to capture that moment because it may be telling you something.

Dr. Pennington: it may look like a snow storm, and maybe it is a snow storm, or maybe one of the instruments has gone haywire.

Student: but if its not defined in the properties, within the limits, then it’s considered an anomaly.

Dr. Pennington: right, right

Student: so this might be on the scope of design, but do you think it would be helpful in that case to be able to synchronize weather data?

Dr. Pennington: that’s a good idea, if you had some other source of information that you could use to [track]

Dr. Gates: That’s number 7 on the second page. The question is will we have access to check for predefined values, historical values, and time constraints.

Dr. Pennington: yeah so you could imagine, instead of me specifying the temperature range that I expect from a particular day maybe I could access the weather and climate data base and just say compare this value to that data source over there. I hadn’t thought about that, but yeah that would be helpful.

Student: I want to ask something on performance in terms of speed, for example would it be preferred to just have something that’s not going to be very flashy, but gets you the very essentials in a very simplistic manner, just quickly or is it ok if it takes those extra seconds more but gives you a big a more, not flashy but more precise range of data, like what’s more important when your viewing this, that you get a lot even though it takes some time?

Dr. Pennington: well I think its always a good design to provide the things that you cant provide fast as fast as fast you can, and you crank all the others in the background. That’s always a design decision. Nobody likes to wait, for anything. Some things take time.

Student: I’m just asking how imperative, if its just a slight annoyance

Dr. Gates: How important is it? Is performance important?

Dr. Pennington: Performance is always important. But, if I’m looking at trade off.

Dr. Gates: He’s looking at a trade off, and I think that’s part of analysis. [Note: what follows should be ignored--When you look at analysis and then you start saying I’m going to add these bells and whistles. That’s part of the analysis part.]

Dr. Pennington: I mean it would be easier if you came with a real concrete sort of would you rather have us provide this information right up front, and this is five minutes later, or we can provide this in two minutes if I don’t do this. If you give me something concrete like that its an easier choice to make.

Dr. Gates: I’m going to jump to question 10. If an anomaly has occurred because of a faulty sensor or a sensor needs to be recalibrated, how should that be reported? I think you kind of talked a little bit about anomalies. Is there anything else you want to add?

Dr. Pennington: I think/guess you need provide some choices to the user. In some cases you they may want instant notification on their mobile. Its sort of, I donno if you guys work with the airlines at all. But they have all these choices about if the flight is delayed do you want to be notified an hour in advance or do you want to know the day before or do you want to know by phone or by email. When I comes to contact, that’s a very individual sort of choice so you need to provide those choices.

Student: I need to go back to the data property thing a bit, but from what I’ve read I thought the data property also sort of do calculations between other sensors.

Dr. Pennington: could be, yeah might be. Part of understanding the failure of a sensor is knowing how it is supposed to be. If this sensor is showing lower and lower and lower values, then maybe this sensor is supposed to be showing higher and higher and higher, there correlated. Maybe inversely correlated or they maybe regular. But there’s a correlation that were expecting, if the readings are not correlated like they’re supposed to be then that could be an indication that there is something wrong with the sensor. So you may be, almost certainly in many instances will be comparing across different sensors.

Dr. Gates: that’s a good question and we’ll be digging into that more on Tuesday.

Student: so that’s a capability that’s already in place with the..

Dr. Gates: Yes

Student: I have a question that kind of builds on what he was talking about. How be able to distinguish between what would be an anomaly and what would be considered a faulty sensor?

Dr. Pennington: I mean that would have to be the scientist would do the analysis on that. I think it’s going to be hard to tell just from the data. Unless the data flat lines, then you know that’s a problem with the sensor. But if it’s a calibration problem that’s much harder to detect, I think in most unless it’s just a flat out failure its going to take some analysis from the scientist to try to understand that.

Dr. Gates: Just to give you a scenario. There’s so much information that streaming. Depending if you’re doing this, if it’s on constantly and part of the tool. It is just to help the scientist to look at those places where unusual things are happening and then to be able to analyze it. So it’s not sophisticated enough at this time to be able to say with certainty that this is a problem that has occurred.

Dr. Pennington: Just think about if I’m working with satellite data, I might have Petta-Bytes of satellite data