AUDIENCE: Are you really wanting an excel style spreadsheet?

PROFESSOR: A word table is fine. I would like to see a table.

AUDIENCE: It looks more like a journal, I'd say, than a table.

PROFESSOR: Yeah, that's OK. So it looks as if you converted your table, and then you converted the table to text, or something like that. And it looks like there's this paragraph on that.

AUDIENCE: Yes. It's like the journal of our game.

PROFESSOR: That's fine. As long I get a shape of the history of the game, and the reasons why you made changes. That's the thing I'm really looking for. The table format does make it easier for me to read. In the future, I would like [INAUDIBLE] things. But because I didn't make that clear in this assignment at all, as long as I can trace the history of the game, I am good. Other questions?

If anyone has a copy of the syllabus, do check it out. I do think the one-page write up is due the following week, on Monday. This coming Monday. I'm actually not going to be here on Monday. I'll be traveling to give a talk, so Rick will be heading next week's classes. Basically Monday and Wednesday. So, I'll catch you-- grading might be delayed by a little bit.

AUDIENCE: [INAUDIBLE]

PROFESSOR: A little [INAUDIBLE] Yeah. That one in particular, [INAUDIBLE]. For the assignment itself, for the group submissions, I would actually like to see hard copies, so I can keep it all together. The game itself obviously needs to be a hard copy. But then if I can get a print out of your change log and everything is all in one place.

Oh, by the way, on Wednesday, I will come in with a whole bunch of Amazon boxes. Old Amazon empty boxes, so that you can just put your games into an appropriate size box. If you--

AUDIENCE: [INAUDIBLE]

PROFESSOR: Yes, after this talk I will go in and grab the prototyping cases. I'll bring them down here, and

you will probably have at least an hour and a 1/2, if not two hours to work on them.

So, today's reading was from *The Design of Everyday Things,* also known as the psychology of everyday things. You probably noticed we skipped from chapter 1 all the way to chapter 4. Part of the reason for that is chapter 4 is kind of a summary of chapters 2 and 3. Chapters 2 and 3 have tons of nice case examples. It walks you through the reasoning, explaining things in detail.

Again, I will recommend this book to anybody who is doing any kind of design where he would be expected to touch your design. And it's really, really easy to read. Hopefully you enjoyed today's reading. So what I'm going to go into today is actually a little bit more detail about the stuff that wasn't covered in chapter 4. In chapter 3 in this book, Donald Norman actually lays out this-- his mental model of how people make decisions when they are confronted with a piece of technology or a designed object that they don't quite understand. We first saw this briefly in chapter 4, but I thought I'd like to go into a little bit more detail about this before going to the stuff that's actually in chapter 4.

So he's got this basic idea that every time you interact with any kind of technology, whether that's a chair you've never seen before, or a car, or a computer program, you go through this loop. You have got some goals as an individual human being. Get a new microwave oven, I would like to eat something. And then you go through this loop of trying to figure out how this new microwave oven works.

You have some sort of intention. The goal might be, OK I want to eat something. So my intention is to warm up this TV dinner. I plan. OK, the plan is that I've got to prep this TV dinner somehow.

So I'm going to go through a series of steps. I guess I need to take the wrapping off. Maybe I peeled back the plastic a little bit. Sometimes I get confused, too. And then you actually have to peel it. And then, instead of peeling up nicely, it peels up into little strips. Has this is ever happened to you? And it comes up in your fingers. That's the execution part, right?

So I know what I want it to do, but I actually have to go and do it. And then I get feedback. I'm not even talking about the microwave oven, I'm talking about just the TV dinner right now. I see the feedback. The thing peeled back, but it didn't peel back the way that I want it to. I see it. I have to interpret whether that's getting me closer to my goal. Well, all I really want is a

couple of holes for the steam to come out. So OK I guess that's good enough. And I evaluate that as being good enough.

So I can proceed to the next step on my plan of getting dinner. So my intention now is to actually put this thing into the microwave oven as I've planned. To heat it up for 30 seconds. Which means a series of steps to actually push buttons to heat it up for 30 seconds. I have to make sure I don't set it to 30 minutes, so I punched a button to make sure I don't hit too many zeroes. I see the feedback on the screen. I perceive whether that's what I want or not. Sometimes it's not what I want. I punched in 30 minutes by mistake. I interpret that 30 zero zero as 30 minutes, I evaluate that's not what I want it to do. And then I make another set of intentions to solve that problem.

So this is a model. And this is actually seven steps, even though I've got eight boxes. One, two, three, four, five, six, seven. This thing here happens in the system. It happens with the thing that you are trying to interact with. You can expand it into what you think of as a computer program. This will be expanded into a huge algorithm, or the thing that the computer has to solve. And figure out what you were trying to do, and tried to do. And try to communicate back to you whether that was successful or not. That's not really what I want you to worry about right now. But these seven steps are all happening in the human. And all these steps are an opportunity for something to go wrong.

Let me give you an example, from games in particular. These are some of the considerations that you might have in a game. There are-- say it's a competitive game. You. want to win, you don't want to lose. So how do I win? How can I win, gathering a lot of money or resources or getting more points, or knocking out my opponent. What are my options right now? Maybe it's a card based game, and the options all laid out in the cards that you're holding. Maybe you have the same three decisions every turn.

So, given all those options, what do I want to do? And then you actually have to execute that. If it's some sort of dexterity game, where you have to flick tokens on a board, that's kind of tough. Maybe you just place the card face down. You need to make sure you pick the right card before placing face down and not placing it face up by accident.

The game reacts. That could involve other people. That could involve a computer. That could just involve how the board looks. And then you as a human being now see the perceived state

of the game, and figure out whether that got you any closer to where you wanted to be. You say, oh, I made that move. And man, that was a terrible move. And I know that because that took points away from me. So now I need to figure out what's my next step. I make a plan and go on, and on, and so forth.

So, the idea that Donald Norman talks about, mental models, is basically this idea that the human beings who are playing your game have an idea of how your game works. And they might be right. They might be wrong. Or maybe somewhat vaguely right, but not quite there. Now as a designer of a game, then you are creating the system that players are interacting with. Everything that I talked about earlier was happening between the player system. But you're the designer who is trying to machine the system into something that a player can understand.

That should actually sound familiar because we talked a little bit about this. Mechanic-dynamic aesthetic. If you as a designer, are designing a system, are creating the mechanics of the game. Players experiencing the aesthetics of a game have all kinds of resultant dynamics that are coming from both how your rules define what the player is going to do as well as how the player decides they're going to execute your rules. So it's this weird, horrible, second-order problem, which results in you trying to communicate to the player, this is what's happening underneath the hood and you really need to understand this to be able to make good decisions.

So again, the player develops a mental model of how the system works by interacting with the system. The player tries to play a game by poking at it. And the user then uses that model, that happens to exist in the player's head, to anticipate what that system is going to do in the future if he did something differently. And that mental model gives the player an explanation for why the system is behaving in a way that it does.

The designer also has a mental model. You all have an idea of how your teams currently work. Whether or not your games actually work that way, because if I read your rules I may interpret it differently. But right now you have an idea of how your game works because you've been working with these things for two weeks. And you are materializing that into a set of game mechanics, a bunch of rules. The player has to interpret, and then create their own mental model out of that. So you can imagine so many different possibilities of things just going wrong. I'm going to talk a little bit about that.

So one of them are mistakes that a player makes. There are two different kinds of mistakes that I want to talk about and try to introduce this vocabulary to you so that when you're talking with your teams you can use clear language. If you have gone through CMS 611 before, you've seen a version of this presentation. I have had to change up the examples, so that these are board game examples. Flips are when the player knows what's supposed to happen and what they're supposed to do. The player just happens to accidentally do the wrong thing.

Real world slips including-- has anybody tried to call somebody on the phone, dialed in the number, and accidentally dialed somebody else that really well? It's not like you didn't know each person's phone numbers. You just automatically started dialing the wrong number, which you knew you also knew very well. Driving, if you drive, you and you want to drive your friend's house you accidentally end at work because you just got into a routine. Halfway through a task you forget what you're doing. It's not like you don't actually know what your task is, you just happened to forget it in the middle of doing it. Pushing a similar button to the one that you actually wanted, that sort of thing. Dealing cards. Everybody gets five cards. How many have I got? That person has five cards, six cards, five cards, five cards, or something like that. People come up with systems like this to be able to help them keep track of how many cards they gave out. But it's not like you didn't know that you were supposed to do five cards, you just lost track.

So that's a slip. That's not a problem of a player's mental model. The player, he understands how his game was supposed to work. Well, there are also mistakes, which are errors in the player's mental model. The player thinks the game works in a certain way and a game doesn't actually-- isn't actually supposed to work in that way.

So this is a product placement shot of-- a beauty shot, of a beautifully hand-crafted, machined [INAUDIBLE] What's wrong with that?

AUDIENCE: [INAUDIBLE]

PROFESSOR: Yes you can't put cities on adjacent spots. I think you can't even put it adjacent your opponents.

AUDIENCE: That's right. Two apart.

PROFESSOR: Two cities cannot be right next to each other. It makes for a nice photo, but the person who set this up clearly never actually played the game. It's still beautiful work. That player has-- if

the person was actually playing the game. This person have the wrong idea about how this game is played? That's actually sometimes perfectly fine. That's part of learning. You make a mistake. If the game corrects you, and then you learn how to compensate for that, or play differently, that's just the process of learning the game. People make mistakes while they're learning the game all the time.

If you're playing a computer game, sometimes that's all the fun of playing the game. Trying to figure out how this crazy computer game works. Probing it, and then the game punishes you because that was the wrong decision. And then you learn not to do that and then you try a different strategy. In fact, the game where you never fail-- and it's actually fairly easy to make a computer game where you never fail-- isn't that interesting for a player because that means you can just use whatever strategy you went in with and it will always work. There's no reason for you to think that this game needs smart strategy or has any depth to it.

Whereas, a game where you try out the strategy you came in with and maybe works a little bit and, then it stops working. And then getting feedback on the why it might not be working, well that tells you, hey he doesn't know there's something underneath the hood here. Maybe I can explore this game a little bit further.

That was an interesting study from Jester Juul, who is a game scholar, who wrote the book *The Art of Failure.* One of the tricks that-- he made this really simple kind of snake type game where you pick things up and it just gets longer. And he ask people to just rate the game at the end of the game. The game was the same, no matter who played it. But some people played it better, some people play it-- played it worse. The people who never failed once in beating, I think, five levels of the game, rated that game as being lower than someone who failed once or twice. And somebody who played it once or twice rated it a seven or eight. Some people who never failed, that rated it a five. People who could never get past the first level will also rate it a five or four.

So people who get frustrated if they can't find the right mental model to play this game. It's like, none of my strategies work. I don't understand this game. I don't get this game. This is frustrating. I hate this game. And the alternative is, I completely get this game. I saw right through it the moment I-- you put this in front of me. I beat it in less than five minutes. My strategy just worked. Eh, not much there. And the people who feel a little bit halfway but then managed to complete the rest of the game because they changed the strategy. Woohoo, that's a pretty good game. They gave me a challenge and I overcame it.

So let's talk a little about feedback. How do we give users this type of really, really valuable information to correct those mental models? I guess I'm skipping to the right side of the slide here. So we need to tell the player that an error has happened, and we need to give them tools to recover. Often, in a board game or in a card game, that kind of telling the player an error has happened needs to be enforced by other people. So you need to give the other players tools to detect when the game is on the verge of crashing, when someone has executed an illegal move, and then give them some sort of structure to be able to correct that. I'll give you a bit more example about that in a second.

The alternative of the process, you just let them make the mistake. Their location-- or, on occasion they are making a move that is an error, that is a mistake, because they don't understand how this game is supposed to work, but its a legal move. And then, as a designer, so you have the option of giving them tools to fix that problem. It's like, all right you made a suboptimal move. It isn't going to get you any closer to your winning goal, but I'm going to give you kinds of rules to be able to then recover from that mistake.

Of course you could also just prevent some of those mistakes from happening, right? In the *Settlers of Cataan* board, they actually had slots of the right size to be able to put the pieces. You know that's a constraint, that's a typical constraint that prevents you from putting the wrong piece in the wrong place.

Ways to be checked and confirmation-- again, usually tend to happen with other players. Or maybe a referee. Especially in sports, you want to think about the role of the referee and what the referee should be checking for. But if you're making a computer game then the computer is doing that for you.

Let's talk about the kinds of error recovery. That's backward error recovery, which is undo, basically. I'm taking back that move. In chess, the rule is if you've got your hand still on the piece, you can still take it back.

AUDIENCE: Not in tournament play.

PROFESSOR: Not in tournament play?

AUDIENCE: In tournament play, it's touch move.

PROFESSOR: It's touch move?

AUDIENCE: As long as your hand is on it If you touch an opponent's piece, you have to capture that piece.

PROFESSOR: Oh, yes.

AUDIENCE: If you touch your piece, then you have to make a legal move with that.

PROFESSOR: Yes, you have to make a legal move with that. But you could-- if it was a knight, I move this way, or it could move that way. If I moved it that way I can still move it over there if I haven't let go.

AUDIENCE: [INAUDIBLE]

PROFESSOR: Yes I do hit a clock. Because in tournament play, especially when clocked, in timed tournament play, which is how it is usually done, there's still a penalty for that. You're still losing time, even if you're correct. But at least there's a very clear stated set in the rules of this is how you take that move back. And this is where you're not allowed to take that move back, which is basically when you let go of the piece.

Forward error recovery is more about, again, giving people tools be able to compensate. Mario-- this is not a board game example, obviously. You jump, and you can change your direction in mid-air. So you can do a jump that you are not going to complete and you will fall to your death. But you can go backwards while you're flying in mid-air and then land back where you started. Again you lose time, but otherwise you haven't lost the game. So that's forward every recovery. You've made the decision, and that's a decision I wanted. And then you fix it. So you take a new action to compensate.

Now affordances comes up in Donald Norman, but I believe he goes into more detail about it in chapter 2 and chapter 1. So we are going to go into different kinds of affordances and constraints. So affordances are things that are aspects of the thing that you're confronted with that invites you to do something.

So we talked a little bit about affordances of materials. Glass invites breaking. Porous wood invites writing on. Door handles are one thing that comes up a lot Donald Norman. We have a door handle that is not all that different from this on the door in this class. And that handle, it's about hand-sized, it invites you to grab it. You could turn it, you could pull it, you could push it. So there are bigger constraints when you look at a door like that door, that tell you about what that function of this handle is supposed to be.

First of all it's like a semantic constraint. You've been taught: that thing is a door. You know, you've seen a million doors just like that. And so you say, it's a door, it must open somehow. Have any of you just found a random door on campus that just doesn't open? It's not locked, it just doesn't open. Or maybe it opens into a brick wall. Yeah?

AUDIENCE: [INAUDIBLE] No, not here.

PROFESSOR: Right. Did it just not open, or does it open into something bizarre?

AUDIENCE: Into a wall.

PROFESSOR: A brick wall, right? Yes, that's betraying the semantic constraint. The door is not supposed to open it to a wall, it's supposed to open into another space that you can go through. It's a door, it must open somehow. And so you look at a door and see all the different ways that you can open it.

Now in emergency doors, you have these things often called crash bars. And what you see over there is pretty popular, but not the only way to implement this idea. A crash bar is designed so that you make it very, very clear that this door only opens in one way, to try limit how much mental processing you need to think about because it's usually put on emergency exits.

But this particular one, you could grab this. You can grab this with your hand. You could push it, you could grab it, you can pull it up, you can push it down. There is a logical constraint, the more you grab your hands on something like this, you really can't see the lock. You just see the door, and the door is closed. As soon as you grab this, you realize that this hinge is spring loaded and can only go down. So there is this logic, there's a logical constraint there. This is a hinge that can go up and down, but already in the up position.

So in order to activate this thing, you push it down, which encourages pushing rather than pulling. So it encourages you to exert force in the correct direction, assuming that the door opens outwards. If it opens inwards, then you really put the door handle on the wrong side of the door.

There are also physical constraints, back to the example I talked about, the *Settlers of Cataan* board. This is a different kind of crash bar but this one I think does a slightly better job because it actually kind of difficult to grab. It is actually pretty wide. And it's much wider and a

lot of people's hands. It's really easy to push. So, just physically it makes it difficult for you to do the wrong thing, to pull out the door that generally opens outwards.

But because this doesn't tell you where it hinges, it doesn't tell you whether the door opens to the left or the door opens to the right. If you push too hard on the wrong side of the door, where the hinges are, the door doesn't really open. I guess it would be hard to open, but if you just gently push it, it won't open. Which is why you get these, which is offset to one side.

And there are cultural constraints that are associated with that. Like the blue slightly rubberized, grippy surface encourages you to put your hands on that. There's a physical constraint. Because it's off-center, if you push anywhere along this part you won't generate enough torque to be able to open the door easily. I'm not so sure about this sticker that's over here, but I do think they kind of informed you that this is actually something where you put your hand. because this is rubber and there is ink on there. This is rubberised, and it's coated, and it's clearly hand-size. It's inviting you to push it. So that is cultural because of the colors, of the material, of the rubber. That says, this is something for you to put your hands on.

So there are four different kinds of constraints that I went through. There are cultural constraints, which is what I was talking about-- the blue. There's the physical-- the physical constraints are just making it hard for you to do the wrong thing in the same way that certain pieces in certain games are easy to pick up because you are going to be picking up a lot. Certain things are easy to roll. Those things that are hard to pick up because you're not supposed to be picking them up, maybe you're supposed to be sliding them around. There are logical constraints, where if you just look at it for a second, you will say well, it can't be this, therefore it must be that. And finally, there are semantic constraints of when I say something is a door, you expect to be able to go through it.

Same thing for a game. If you see a door in a game, it is labelled door, you expect that door leads somewhere in the game. I think there is a version of *Clue* that I used to play when I was a very, very little kid. And if you remember the *Clue* board, it looked like a floor plan of a house. It has windows and stuff like that, and that implies that you can go outside of the house. But you can't really go outside the house, that would be breaking the rules. That confused me when I was five years old, because I expected that you'd be able to go through any door.

A couple of other things you can do to help people understand your game, it's context. Where

how things are placed next to other things that suggest how they're supposed to be used. This is *Boggle,* and when you open it, you get these two pieces. Well you actually get [INAUDIBLE]. But you get these things together, and as soon as you see this if you know what an hourglass is, you immediately know that this is a timed game. Whether or not you read it on the box that this was a game that was timed, whether you've ever played this game before. When you see a timer that's packed in the same box with things, that suggests that this is a game that you play with Time.

So that's one way of thinking context. I'm going to go to a few more examples later on and I want you to think about how things are placed next to each other suggests how they're supposed to be used. Context also comes from how you name things and how you provide art. This is not something to worry about in assignment 1, but you're going to have to worry about in assignment 2.

How many of you have played *Diplomacy?* Do you still play *Diplomacy* with the same people that you played with?

AUDIENCE: No.

PROFESSOR: You don't talk to them anymore? No? OK. That's the problem with *Diplomacy.* How good are you at playing *Risk?* OK, if you just look at a *Diplomacy* board or a *Risk* board, they don't look all that different. It's a world map. I think in *Diplomacy* it's a modern European map. But now, this game is a game of international intrigue, trust, and treasury, and called diplomacy. And this game called the game of global domination. Risk.

Just look at the way they're presented. Why don't you tell me, what did these boxes tell you about these games?

AUDIENCE: *Risk* has a bunch of cannons and [INAUDIBLE], so you're probably going to be fighting and attacking stuff.

PROFESSOR: OK. Yeah, more conflict.

AUDIENCE: *Diplomacy,* it looks like guy is hanging around. And there's a sword and wine glass, so maybe there's a bit of fighting, or a bit of wheeling and dealing, but it seems like mostly you'll be talking to people.

PROFESSOR: OK, there'll be lot of talking in this game.

AUDIENCE: I get the sense that they might leaders discussing a deal.

PROFESSOR: There's a world map and a globe to remind you. Yes, they're making decisions on behalf of all the world.

AUDIENCE: If anything, it seems like these are people behind the throne and making shady deals.

PROFESSOR: Ah, shadow presidents, or kings. I guess at the time that this game is set-- the world of czars and kaisers. So you're making shady deals with authority to be able to determine the fate of the world. And *Risk?* Stomp over everything. I'm going to take my army and I'm going to meet your army and we're going to figure out who's got a bigger army. That's the game. That is another hint, in the titles *Diplomacy* and *Risk. Diplomacy* is a game about diplomacy. It's about talking to people and making deals, and breaking deals at opportune times. And this is why people who people don't often play diplomacy with the same people anymore. It is a great friendship killer. *Risk* is a game about-- I'm going all in! I might win this if the dice roll in my favor, so it's about risk. The game is about risking everything on big gambles. And it's actually a pretty good example of what this game is expecting you to do. So immediately, just by looking at the box, the games are already trying to condition you to think the way you need to think in order to well in this game.

Let's see. Visibility. This comes up a million times in Donald Norman. And when you're designing your games, you need to think about how to be able to make what's happening in your game more visible to the players who need to make decisions about that. This is a very close-up view of the game called *Cosmic Encounter,* which we will play later on. And it has this *Risk*- like element that I am going to put my army of flying saucers against your army of flying saucers. But we're going to be fighting on multiple fronts at once, and that's actually going to be-- in the game, you can join forces. So I can keep up with you to go up against a planet that's been held by you. But somebody else is going to join in and try to help defend your planet. And so they have this system of stackable tokens to basically be able to then very, very easily see whose pile is higher. Right now, these are all the defenders, so they are all on this little [INAUDIBLE]. There is actually this big flat spike where you stack all of the attacking ships and you put them in the direction on the planet you are attacking.

So to just makes things very, very clear, this is how big the army is that's attacking is, and this is how big the army that's defending is. Even though there are many, many, many, many different forces involved. So they're making visible what the current state is. Again it's kind of a

diplomatic game of like *Diplomacy.* In the middle of every combat, you have both sides asking all the players not involved in the combat to please contribute something to this-- please contribute a ship or two to this attack. And they're making deals all the time.

Even days are not really about visibility take advantage of visibility. The whole idea of *Battleship* is that you don't know where your opponents are. But they gave you all these useful tools, these red pegs and white pegs, and a whole extra grid to be able to keep track of where you bombed before, and where you were successful.

AUDIENCE: Can you imagine without the second grid?

PROFESSOR: Yes, it's possible. I mean, you would probably end up drawing your own second grid pretty quickly just to keep track of where the you hit before. There's other things up here, as well. [INAUDIBLE] actually that's what it's describing-- how big each ship is. You've got your own fleet to keep track of, what the possible ships are, and how long they are. This person uses white tokens to keep track of where the enemy has bombed, which is something you don't have to do in the game to do well. It is probably useful information, but you have the tools. The player has all of these tools to be able to keep track of that information. So this game has gone a long way to try to make the little bit of information that you do get over the play of the game-- the little of information that you reveal over the game as visible as possible, so that you can make the next logical decision as easily as possible.

Previous user experience goes a long way in helping people understand games. And these are dice with nontraditional numbers that you expect to find on a dice. But you see a dice, you kind of know what to do with it. You pick it up, you roll it, and it will give you a number. And that number is a number that you have for that turn. There's also the little dot that distinguishes the nines from the sixes. That comes from other games. I think a lot of people see that from games in particular because I can't think of any other situations in real life where something might be flipped upside down and you have to interpret that number.

In fact, there's a Kickstarter out, or at least that was. The Kickstarter for this project, we took a whole bunch of cards, and a whole bunch of different randomized things depicted in a photoshopped photo. So it was a whole deck of cards. I think it was a standard poker deck. But it also had all these other randomizing things. It had a dreidel, it had a dice with [INAUDIBLE] on it. It had different size of dices. It had one of those counting sticks. There's a lot of things here that I am not really sure if I could tell you the name of it, but you could

probably figure out how it works. What does that look like? It looks like a compass. Now, knowing that this is a randomizing element, how do you think that will be used if actually had it in real life?

AUDIENCE: It's a spinner

PROFESSOR: Yes, it's a spinner. It's a [INAUDIBLE] spinner, in particular. You can spin for one out of six sides on the inside, and one out of eight, sides in the top. But there are a couple of key things, like the coins. You could use this deck of cards for coin flips, if you wanted. And there is also these weird fortune cookies. Anyway, it's a cute idea, but you don't-- I don't need to explain to you how to use this. It's just a whole deck with different pictures on it, and you know and you can use it to randomize different letters and different numbers.

AUDIENCE: [INAUDIBLE]

PROFESSOR: I forget the name of it.

AUDIENCE: No, what was the point?

PROFESSOR: The point was that you will get a deck of cards with every card is different. And every club looks kind of like this but it has different randomizing results on it.

Cultural cues. This was actually played by a pair of friends. There is a game called *War on Terror.* There's a very satirical game. Basically, everybody has exactly the same strategy. Everyone's in charge of a country, basically. Everyone is after oil. Everybody has the same strategies and the same tactics. But if you cross a certain point, you get branded as evil and you have to wear the evil balaclava. And that immediately is a trigger for everybody to gang up on that person. So what the game is really trying-- the point of the game is that the game is trying to drive home the point that everybody is engaged. All the powers are engaging in exactly the same tactics. At the moment that you actually get declared as evil, you actually get a little bit more freedom than what you're about to do because you don't have to worry about other people branding you as evil.

So the whole idea of-- here is this person in this balaclava. And it had-- it had the word evil on top to make it clear, but I don't think that was actually necessary. [INAUDIBLE] a regular [INAUDIBLE] I guess it caught the point that this person is now marked as the bad guy. It is actually a metaphor for something that-- I actually had some trouble coming up with board game examples. it happens a lot more often in computers, where you get some sort of

metaphor to imply how it's supposed to be used. You're not going to exactly use it that way. So for instance, what are these things up here

AUDIENCE: [INAUDIBLE]

PROFESSOR: [INAUDIBLE] So what do you think you do if I'm in the game and in this piece of software?

AUDIENCE: You're going to read the inbox or put it into the outbox.

PROFESSOR: You can send messages, and read, and check what messages you receive. That's a metaphor that we keep it mail software today. Anybody recognize that?

AUDIENCE: It's a Rolodex.

PROFESSOR: Oh, people still recognise Rolodexes. That's cool. What does a Rolodex do?

AUDIENCE: Contacts.

PROFESSOR: Contacts. So that just gives you a list of all the people. this gives you an idea of how old this screenshot is. This looks like a planner, some kind of scheduler. Magic lamp. Genies. You click on it and can ask things. Help, maybe? Not quite sure.

AUDIENCE: Wishes.

PROFESSOR: Wishes, maybe. Wishes maybe connect you to tech support. I don't know. You can see the metaphor break down here. This is a phone?

AUDIENCE: A fax, maybe?

PROFESSOR: A fax maybe. I'm looking at this, and I do a little bit about the machine that this was designed for, and it didn't have-- you couldn't make phone calls with it. So I have no idea what this thing actually does. Maybe send pictures. This thing looks like a--

AUDIENCE: A purse or briefcase.

PROFESSOR: A purse, or a briefcase or a bag. It's a metaphor or something, but it might be cash transactions. But I doubt it. It could be your files that you save, who knows. Things are starting to break down. But you still have this desktop metaphor that we still maintain in a lot of user interfaces. This is somewhat-- this is a real kicker. This is extra [INAUDIBLE] the hallway. I have no Idea what to expect the hallway. User interface. Maybe other applications.

We have that a little bit in both games, especially board games that are produced in many, many, many different languages. Because they have-- they can't slap words on the tokens. Because if you slap words on it and want to then release the same product in a different language for a different country, then you have to change all the words and that increases manufacturing costs. So they try to use generic tokens and then just explain everything in the rules which they can print fairly cheaply, and they can include six European languages if the same box. That won't be a problem.

This is a game called *Agricola.* And it's called a worker placement game. Because what it basically is, is that you've got a bunch of members of your family of your little farming homestead. And then you send them out every turn to do tasks, like go to the fireplace and cook some meat, or go to the market and buy some more feed, or build some fences. Something like that. So what you do is you take these tokens and you put that on the cart.

So this is both context and an interaction metaphor. By taking this thing and putting it on this cart, I'm achieving quite a large number of different things. I'm saying, this is the action that I'm taking. I am saying I have one, two, three, four, five different things that I could do. Actually, I am not sure. but there's at least four different things that I can do on my turn. Every time I take one of these things and then put it on a cart, like the cart that you see you on the right, that means that that's going to be my action for this turn. The other thing that this game does is that once what I've decided that I'm going to do that, I think in *Agricola* once you take it, nobody else can take it. So I can take over the fireplace and no one else can take over the fireplace. I can put two people on the same fireplace,certainly.

So that's a metaphor, right? Now it doesn't really matter that you-- you don't really have to count everything in family members. You could just say you have four actions that you can take per turn. And you just choose which four actions that you get to do, do all the math that is necessary to improve your farm and that's it. But they turned your family members into your action counter, into your action points. The more family members that you have, the more different actions that you can take within your turn. So your family members are your metaphor for action points. We get the same thing in other games with things like workers.

Finally, just a very quick word about accessibility. This is usually something I go into much more detail in in my computer games classes, but with board games classes one thing I do want you to keep in mind is colorblindness. I want you to, If you have colorblindness, or if you

have friends who are colorblind, you definitely want them to take a look at your design, and see whether it is possible for them to play your game. Take a picture through Instagram, or something like that, and put in a black and white filter. See whether your game is still legible and possible to play with all the colors removed.

You can accomplish a lot of things by just changing up your tokens, by putting additional marks on the tokens that are high contrast so that they don't-- they are not completely reliant on color. If [INAUDIBLE] you can look at bright and dark as well. That's all. If you take that into consideration in your design, you will definitely get kudos from the instructors when they are grading. Because that means you have taken the effort in trying to increase the range of people who can play your game.

So, that's pretty much what I have to say about usability for today. Any questions? This is not something you have to worry too much about for assignment one. But it's something that you definitely have to think about whenever you're trying to create a game for lots and lots and lots of other people to play. So you will want to definitely start taking this into consideration. What pieces are you choosing? What do the pieces tell you about how to play this game? How does your board tell you how to play your game, even if the rules are not printed on the board? What are the clues that you're giving the player to be able to form that mental model, so you can get them past that learning stage where they're just making mistakes and start making decisions about how they want to play the game in a way that's satisfying to them. And giving them feedback on whether those decisions works out for that. So that's the presentation. And now I guess it's team time to work on your projects. I am going-- Rick and I will go get boxes and we'll be right back. Anyone needs to take a break now is a good time.