



Stanford eCorner

Creativity, Inc. [Entire Talk]

Ed Catmull, *Disney/Pixar Animation*

April 30, 2014

Video URL: <http://ecorner.stanford.edu/videos/3321/Creativity-Inc-Entire-Talk>

Ed Catmull, president of Walt Disney and Pixar Animation Studios, shares some of his formative career experiences and offers a glimpse inside the working culture of Disney and Pixar. In conversation with Stanford Professor Bob Sutton, Catmull offers additional insights from his book, *Creativity, Inc.*, including lessons learned from his longtime working relationship with the late Steve Jobs.



Transcript

Today we have a special guest, we have Ed Catmull from Pixar, so he is the President of Pixar and also the President of Dixie, I knew that, Disney Animation. Dixie is a little different company and why we're here today is to talk about... But Disney does use a lot of cups. Disney does use a lot of cups, they do, I would imagine... to talk about his new book *Creativity, Inc.* So Ed has - and just to give, just a little by a way of introduction and also to give a plug. I really, and I just said this to Tina Seelig who's sitting over there somewhere, I really do think this is the most useful and interesting creativity book I've ever read. And note that I wrote one. So I am putting it ahead of one of my books. And the reason it's so interesting, in addition to the fact that it's very well done, and Ed and I were just talking about the very compulsive process by which he and his editors went through to make a great book, is there is just no matching Ed's life and his path, which we're going to talk about of course: Pixar.

And on top of that he weaves together all these sort of ideas about things that you can do to build a more innovative and creative company. So that's what we're going to talk about, and use Pixar as the background. Just one little comment that I thought was amusing, I was lucky to be one of among 40 people who were given an early version of the book to read and give comments. And this is sort of a hint to Ed's personality and style, is that being a management person I've read and commented on a lot of business books, especially ones by successful senior executives. And after reading the first draft of it, I guess this is the second draft, one of my comments to Ed was "not enough narcissism", which I didn't think was ever possible. And what I meant was, I didn't want him to be more of an ego maniac, was I wanted to hear more about how he was feeling and thinking and what his reasoning was. And just having spent the last couple of days re-reading the book again, I think he really has done a magnificent job of bringing his perspective without real narcissism, it's just your perspective. So without further ado, let's start getting to questions. So, in re-reading the book, one of the things that still strikes me is that as a young boy, you were fascinated with Disney films, but then you did this weird thing. You went off and went another direction and got a PHD in computer science.

Ed did an amazing thing, this hand. Was that your dissertation? No, it was a class project. It was a class project, describe what the hand was? Well, I - by chance I happened to be at the foundation school for computer graphics. I took a class, everybody was supposed to make something. And there was some software they had. Now this time everything was made out of polygons or quadric surfaces and that was it. And they didn't show enough promise, and so I thought what I would do is digitize my left hand. So I made a plaster of Paris mold of it, and I learned later that you should either shave your hand or put Vaseline on the back. And then I carefully digitized this and then I made a little movie of it and it was shown at the ACM conference. Because there was no SIGGRAPH at that time back in 1972.

And it was only those of us who actually ignored the existing software and wrote around it that stayed in computer graphics. So to me I think that story is sort of a diagnostic and maybe we could talk a little bit more about that. The next thing I want to

get to is this amazing experience you had at the New York Institute of Technology. So it's sort of your boyhood dream, being a graphics person, and then you moved into computer science. So maybe we could talk a little bit about how you thought about bringing those things together and how that's sort of affected what happened subsequently. Well for the - I grew up in the 1950s, so my parents, and I didn't know this at the time because we were just growing up - it was a safe neighborhood. It was only years later I looked back and thought, oh, they just went through the depression and World War II. And now we were in this bubble of the 1950s, and the two iconic figures at that time were Walt Disney and Albert Einstein. So I wanted to be an animator, I watched Walt every Sunday night explain things. I read about it and I did a lot of drawing.

I became fairly good at drawing, and I liked math and physics. And when I got out of high school, I realized that I had no idea what the path was to get to be an animator because there were no schools for it. So I switched over into physics and I got my undergraduate degree in physics and I got a second undergraduate degree in computer science, where I was going to study computer languages at the time. But I returned to school, and this is during the height of the Vietnam War, so it was important to be in school. My draft number was 30, and it probably doesn't mean an awful lot nowadays, but it mattered an awful lot then. I was at this great school, and when I took this course I recognized that the art and the technology side could come together. And while the images were very crude at the time, there was no way you could say this could go on any entertainment thing, there was the potential there. So I worked on solving the problems of trying to make it so that the images looked good enough to go on a feature film and when I got my doctor's degree I went out with the goal of creating the first computer animated film. And my prediction at the time was that it would take 10 years for us to solve the problems. I was wrong.

It took 20. So, you were optimistic. So in between, one of the most amazing stories in the book to me is you got this job offer from this guy from the New York Institute of Technology. And this guy, maybe you shouldn't talk - so the guy's name is Alex Schiller, that's his name? Alex Schiller, Dr. Alex Schiller And so one of my favorite parts to read in the book is that he's word-solid, so he would say things like "our vision will speed up time, eventually deleting it," things like this. So this guy apparently was quite a character. So why don't you describe a little bit about this early attempt to solve this problem, it's sort of amazing. Well, what was really cool for me just coming out with this vision was here was a man who ran this college on Long Island, and he wanted to be the new Walt Disney. Now he never said he wanted to be Walt Disney, what he said every day that he didn't want to be the new Walt Disney. But he was willing to fund it, and at that time I was in-charge of this brand new lab and hiring people.

And Alby Ray Smith, who graduated from here, was actually my second hire there. And it was just an amazing opportunity, here was a man that was willing to fund it. But at that time I did not want to be a manager. So I had some theories about how to manage so that I could get some really good, smart people in there and have them be so highly self-motivated that I wouldn't need to manage them and I could do my interesting work. So five years later I was hired away by George Lucas, and we had actually a pretty great group and had made a lot of right decisions. But I remember at the time looking back, thinking when I came here I had some ideas about how to manage. And one third of them were an absolute crock, they just were bad ideas or naive. Two thirds of them actually were pretty good. And I felt going forward into Lucasfilm now where there was just an incredible opportunity that the ratio would probably be the same. And the reason I say one third, two thirds because most people have heard that 80/20 rule and the 90/10 rule.

Actually I think the problem is those kind of delude you, because they make you think you're better than you are. And I think you're better off saying, you know I am probably wrong more than I think I am. So let me - let's talk a little bit about the Lucas days next. And then on to Steve buying Pixar. But one thing that really struck me, we were just talking about it a minute ago, was how open you were. So you did a whole bunch of things that almost sound like a modern open source, to build the knowledge around making computer animated films. So how did you come to that decision and how did it help and the like. Because if we look at how closed and how paranoid the companies are, including one Steve Jobs founded for example. But it's an interesting decision that entrepreneurs, a lot of entrepreneurs in the group would have to make, whether to be open or whether to be closed. Well, I came out of a university environment which was very open, so I was inspired by that and I would say it was...

At the time I knew it was an extraordinary environment, in the way that we shared things with each other. So I came out with this idea of making a film, and I wasn't the only one around who wanted to do that. And I was aware, because it was actually a really small field, we're talking about a handful of people here. And they wanted to get there first, they were very competitive with their ideas, and so they did not want to share their discoveries. And at this time SIGGRAPH, the computer graphics community, was brand new. But my belief at the time was that we were so far away from what we needed that the ideas that are current today would get completely by-passed. So we published everything and the rationale was that if we publish everything we are more likely to attract the best people. So we began to accumulate people that not only shared in the vision, but they were very good because they liked the idea of sharing. And we were rewarded because not only we got these people but we were participating in a bigger community, and today most of my friends are still in this community. I really highly value them, we get together all the time.

And actually Steve never actually tried to even when Steve was there we always published and to this day, we still do. In fact for the last couple of years, the papers coming out of Disney and Pixar have been the single biggest block paper submitting institution. So, you've maintained that openness despite Jobs' infamous secrecy at Apple, he was okay with you operating... He never applied it to us. He said we could do it my way. So, let's move on, so you mentioned you got hired by George Lucas when he was at the height of early Star Wars' fame. Tell us a little bit about what you learned and what happened in the early days with Lucas. And then tell us about how you almost got bought by General Motors, which is I think an interesting plot twist. It really surprised me when I read it. So, George had just made Star Wars in 1977, and he was working on a second film: Empire Strikes Back.

And he was going to take a big risk with it, because as you know it ends with a cliff hanger. He believed that the technology of the time is one of the things that helped Star Wars stand apart. He obviously believed in the story, but he had the best people with optomechanics, which you need for doing blue screen matting and those kinds of things. So he was the only person in the industry who was willing to fund bringing high technology into film. So he hired me to bring in expertise in digital audio, video editing and computer graphics. So we then got together and I had learned something about managers, I had got somebody over each group instead of trying to have a flat structure. I had got Andy Moore who came here from Stanford, and Alby running the graphics and Ralph Guggenheim over video editing. And we just started ploughing ahead with full support from George. And it was exciting, it was rewarding. We were also off to the side: that is while they had these really good film makers there, it was clear to me that what we were doing was completely and utterly irrelevant to what they were doing.

But it's George's money and he could spend it the way he wanted. So that was kind of the attitude. So we were off to the side busily doing things there and... So you had two pretty good early sugar daddies actually, if you look back, it was pretty good. Well I would actually count Arpa, now called Arpa, as the first one. And Arpa's way of running at that time I thought was enlightened. I think they went downhill after that and I think they're back on a better track. But their funding of students across the United States with very low bureaucracy I believed was brilliant, and at the time I knew it was great. I loved the model, and then there was Alex Schiller as a sugar daddy, but he knew nothing about film making, and then there was George Lucas who had just made Star Wars and then of course the next two were phenomenal successes. So it was an amazing adventure with exciting people and all these...

So it was great, until it wasn't? Well, in this case George and his wife got separated and George wanted to maintain the control of the company. So she got the cash and he got the company and so they were then cash-poor. And at that time the decision was made to sell us, we had built some hardware that we had designed, so we were going to use that as a basis for the business. And we brought in VCs and we put together a fairly difficult deal to sell. But in the end it was Phillips Medical and General Motors who came through and were willing to buy the company for, to give \$15 million and give \$15 million to us to get us going. And it was within one week of signing when within General Motors the EDS part, the Ross Perot holdovers, and the cars people got into a war with each other. And it brought all the deals to a halt and so ours fell apart, we were very close. But what this was... they weren't a film company, you were selling a piece of computer hardware, right? Yes. What was it? It was called the Pixar image computer.

It was made to composite images together, but it was 4K resolution films, so very high resolution, really fast for that. But it turns out that it was also very good for image processing. So we had as a start up company a lot of orders from free letter agencies around Washington D.C. where the box would be delivered and we'd never hear from them again. And then in the medical image industry, where we did the first volume imaging. And then we entered into a contract with Disney to color the cels. So that hardware we built - and we had to learn how to manufacture it. So when Steve bought us, I'm now the President, I know nothing about being a President of a company, I don't know anything about manufacturing or sales or marketing. And there was nobody in the group that did. So why did Steve buy you guys, that's not exactly an endorsement, the last couple of sentences.

Well, I know, the thing was Steve had worked with consumer products before but he had never worked with the high-end products so he had no instinct for the marketing, pricing, selling or manufacturing of a high-end product. So basically none of us were... But when he bought you, was he buying a computer hardware company or was he buying a movie company is the question. What did he think he was buying? Well, we were still years away from even being practical, so he was buying the people. Okay. Now what happened was after he - we first met him when he was Apple, then he disappeared for some strange reason, and then he - which we learned about a month later and then he re-appeared and he wanted to buy us to use as the foundation for this new computer company, so we declined. So then he went and got some other people. The new computer company was Next? Yes, well, he then went and got some people and that then became Next and after he formed Next, I ran into him at SIGGRAPH, which by co-incidence was in San Francisco. So we walked the floor and he still wanted to buy us as a group and now it was to be what we wanted to be, so we then entered into negotiations, which itself is an interesting long story, we won't go there. But it resulted in him acquiring us.

So, so far I don't see much sign of an organization strategy, this is an aside, but do you believe in organizational strategy

after going through that. Because we haven't got to the story about how Pixar emerged and became a film company, what's your view of a long term planning and organizational strategy? Well, at the time I didn't, I was reading a lot books to try and figure it out but I couldn't actually connect with them. It's like surfing, you have to be at the right place to catch the wave. Well I was never at the right place. So we were just tumbling around there in the ocean. But in terms of strategy, in one sense you could say yes we had a business plan, we had a strategy. But I believed, and I'd say this is very early on, is that for all the planning, when the reality hits I am going to adapt to the reality. So our plans quickly went out the window for a variety of reasons. Either because we had miscalculated it or we didn't know what we were doing. there were a variety of reasons there.

But in our case we kept re-thinking and trying to adapt to what was there. So you were... they call it improvisation. Our colleague Cathy Eisenhower always talks about how a lot of times you just improvise and respond to what's in front of you and the plan goes out the window constantly. So let's talk a little bit about the early... Still doing that... You're still doing that. Talk about sort of the early days, what did you do before you became a film company. How many years was it from the time that Steve bought you, to the point where you were sure you were a film company, because that went on for a while? He acquired us in 1986, the beginning of 1986. And we entered into our contract with Disney to make Toy Story in 1991.

So it was five years, and in the five years we had to go from nothing to hiring the people, figuring out manufacturing. Which was an intense and very educational experience in a surprising way to me. And I learned something which affected my outlook. But we weren't big enough to keep creating new hardware to actually keep up with the wave that was happening in the whole industry as a whole. And so our business plan basically did not work, and then we had to figure out how to gracefully get out without screwing our customers. One of our customers was Disney, and I'm looking at this and saying, okay, well we're kind of doing okay here, we're a little under water. It's not really okay, but he could see where I was going, and it was going more under water. So how do we get out from this? And so a guy called me who was running some other company, he was acquiring all of the image processing companies, figured that if he got all the different products and consolidated them into one company he would have a sustainable business. So he called up and said would you be willing to sell your hardware business? And I said well let me think about it... yes! So I called him back the next day and said yes, we will do this and so we sold it for a million dollars.

And the thing was I knew that they would never pay the \$1 million. And the reason we did it was they would keep manufacturing the box for Disney while we were re-writing the software to go on to Silicon Graphics. Alright. And it turns out, they did fine, they lasted for several years but ultimately, which we knew this, they were doomed. So that's an argument for selling something for nothing and it's still the right thing to do, it's sort of an interesting... Yes, we were trying to protect them and... And Steve was okay with that? Because I mean... This was I mean... By the way, Steve tried to sell the company to Microsoft and Silicon Graphics in between. Yes, under an alias.

So that was, it was a very unusual time. First of all we were losing a lot of money, and so by the time we had done with this, Steve was \$54 million in the hole. So that puts us in an unusual circumstance because you... logically we're... This was before Steve Jobs was really rich. This was a substantial portion of his net worth at that time, as I understand it. Yes, I think the biography said he was worth \$100 million at the time which I don't think was true, I think it was probably double that. He never said, but \$54 million is a significant chunk. So it was very difficult for him, and so he would sell but what he would do when he would sell to Microsoft, he would ask for this number which was outrageously high, and they came back with a really big number but it wasn't the number he asked for. So I am thinking well okay it's over with, I know it's too big of a hole for Steve so they will compromise in the middle.

But Steve wouldn't compromise, and this happened three times. So I finally realized, he's actually not trying to sell this, he was trying to validate whether or not we're worth something. And as soon as somebody says we're worth something he's not going to let them have us. So we dumped the hardware business, we started selling software, we started making commercials and because of our... we had maintained a superb relationship with Disney through all this, and because we had won awards with the shorts, where John directed these shorts. And we're making very good commercials, that we were in a situation, where Disney now having these 4 remarkable films, thought there was a big appetite for animation. So they took a gamble on Nightmare Before Christmas, and they thought that's kind of idiosyncratic. Computer graphics is probably just as weird as stop motion, but we'll take a gamble on it and the term they used was "boutique animation". So we entered into a contract in 1991 to make that film. For Toy Story? Yes.

And that was your first film. So when you were - talk a little bit about what you learned and what happened during the making of the first Toy Story, because I want to hear a little about that. And then one thing that's interesting that I had forgotten until just today when I was re-reading it that Steve decided to do the IPO before the movie even came out, is that correct? Yes so. So it's sort of amazing, I mean you still had made no money at all. Yes, we made no money. So this isn't the way it was supposed to work, they tell me, in your venture capital classes. So it's an amazing story. And this is where Steve was showing his brilliance. Around this time, Next is not working out so well. And I've got a good relationship with Steve, all of us do, but we didn't want him there full time.

He was really good part time, because he faced outwards and he let us, excuse me, I keep raining. Just put it on the table... So we're out trying to figure out how to make this movie. And we were a group that had been through failures together, we'd experienced that. And it was really difficult to figure this out, and we made a lot of miss-estimates. And the first version didn't work very well, but as we got closer it became apparent that we were onto something really big. And I have to say, John Lasseter believed right from the beginning that this was going to be gigantic. But from Disney's point of view it was a boutique film, so they didn't put any consumer products behind it because they didn't see it being anything. But as we got into the last year, it was now apparent it was big. And so Steve said, okay now we are going to revolutionize this industry.

But we are also in a position where because we've got the experience here, not only do we have the first film out, we will probably have the second film out before anybody else can get into this. But the deal that we had with Disney, frankly was not a very good deal, we got like three to five percent of the profit, something like that. So it was not... Not very good. Not very good. So Steve called John and me together and he said, okay, our deal lasts for three pictures and at the end we are on our own. Michael Eisner will realize as soon as this film is successful that he will have just created his biggest nightmare. So he will not want the contract to end. So when the film comes out he will renegotiate, and when we renegotiate I want 50% of the profits. But if we get 50% of profits, that means we have to put up 50% of the money.

So in order for us to put 50% of the money, we have to have the money in the bank, therefore we should go public. So John and I were saying, whoa, whoa, whoa, this is a little early here! Let's prove our worth first. But Steve being Steve, he had a compelling way about him. So we put on the roadshow, we went out and showed pieces of the movie. But what he told people as we went on the roadshow, so I went out with our CFO Lawrence Levy and Steve. And as we went out, the argument was that the company will go public one week after the movie opens, so you will see that we're changing the industry. And so that's the prep, so the movie comes out, it opens huge, it gets incredible reviews and then next week we go public. And it was the biggest IPO, it was bigger than Netscape. Incredible. It was an incredible thing.

So since you mentioned Steve, at some point we should get there, one of my favorite parts of the book... and the book at various times touches on... so you worked with Steve 26 years you said. Yes. And there's also a chapter at the end that's specifically about Steve. One of my favorite parts was you describing how you basically learned how to argue with him without going crazy. So I thought that was quite interesting. Maybe you could describe a little bit about how your relationship evolved and how you learned to... Yes, so certainly as we started with Steve, Steve had a reputation. Which everybody knows, it's part of the public record, people talk a lot about it.

And I want to later address some of that. But I did ask Steve to begin with, I said, so what happens or how do you work if somebody doesn't agree with you. And he said, well I just explain it to them until they understand. So I go back to my colleagues and explain this and they all have this nervous laugh. Now the thing you should understand is, in all the 26 years with Steve, Steve and I never had one of these loud verbal arguments and it's not my nature to do that. So I never actually had an argument with Steve, but we did disagree fairly frequently about things. And the way it worked was, I discovered, it was that I would say something to him and he would immediately shoot it down because he could think faster than I could. So it would end the conversation and I would then wait a week, and usually this was on the telephone. I'd call him up and I give my counter argument to what he had said and he'd immediately shoot it down. So I had to wait another week, and sometimes this went on for months.

But in the end one of three things happened. About a third of the time he said, oh, I get it, you're right and that was the end of it. And it was another third of the time in which you'd say, actually I think he is right. The other third of the time where we didn't reach consensus, he just let me do it my way, never said anything more about it. So it worked out, but it was pretty interesting because I mean I was really struck with that and I don't think we have a lot of time to talk about it at the end. But also you have an argument that especially later in his life he was misunderstood, in terms of just the negativity part glossed over the fact that he got more mature and emotionally sensitive with age. Yes, for me it was an important thing is that you've heard about Steve in those early days and the way he interacted with people. And I was there for that and saw that as it applied in our particular environment. And I saw a lot cases where Steve overreached, or he would go for a home run. And he would get the home run, but he would lose the game.

And what people didn't understand is Steve was so incredibly smart that he was learning from those mistakes. He was learning that certain kinds of overreaching get in the way, and by the time we got to dealing with Disney he was going for a 50-50 partnership. The way he delivered hard news changed with people. And he became an empathetic person, and again there were difficult decisions, and the way Steve delivered the news changed dramatically. Basically most of the people who saw this change in Steve then stayed with him for the rest of his life. Alright, so that arc in Steve is unreported, and the reason it's missed is when reporters or anybody who writes about Steve called to ask us, well Steve was still alive. I'm not going to analyze Steve to a person I don't know, and none of these people would. So the change in Steve which to me was very dramatic, it's not publicly known. So that's well described in the last, the addendum to the book. So we've got about 10 minutes before we open up to questions, what I'd like to do now, is we've talked a lot about what it took to get Pixar through the first film

and the IPO.

But a lot of the book, and to me some of the most interesting parts of the book, are the way that Pixar operates as a routinely creative organization. So maybe there's a couple of different topics you could discuss. One is why don't you talk a little about the brain trust, because to me that's a fascinating part of the film, and think a little bit about how that might apply to other kinds of organizations too. Well the brain trust is something we happened on accidentally. John was the director and he had four people around him who were very focused and funny and really driven and they were passionate about the film itself so they would have intense discussions, but it was never personal. And they basically went through three films together, and this was so successful that as other people were coming out we would add them to this thing and then as I understand they started to call it the brain trust. So there was something about having colleagues giving notes to each other that worked really well. So we tried to apply the principle to other groups, like with our technical groups and others, and we found that it didn't work as well. So then we had to go back and look at it and say, okay what's actually going on here that's making this group work better than just a collection of smart people. Which is, for a lot of people a brain trust means you get your smart people together in a room, you discuss it.

So that's not what I mean. So one of the things we realized is that the brain trust had no authority. They could not tell the director what to do. So when somebody else was directing and now John is a member of it, he could not tell him what to do, I couldn't tell him what to do, Steve couldn't tell him what to do. And the consequence of that is that the director, the person responsible, was not coming into the room in a defensive posture knowing that this group could screw him over. Alright, so it changed the dynamics. But then we had to pay attention to a lot of elements of the dynamics. Because in our case we need a lot of candor about what works and what doesn't work. And what we found, and this is true in most places, is there are good reasons why most people hold back and they don't say what they think. They don't want to embarrass themselves, they don't want to embarrass other people, they want to look good in front of other people, they might want to grand stand.

There are all sorts of personal emotional reasons that get in the way frequently, and most of the time actually they won't admit that they are there. So our view as the managers was not to actually examine the idea at the time, it was to sit back and examine the dynamics of the room. Because if the dynamics are working they are going to solve the problem. So rather than me get caught up in a problem, I wanted to look and see if they are all saying what they think? And the result is we got this group which on the whole has done completely remarkable things. Every once in a while it doesn't work, it collapses. And every once in a while magic happens. But by setting it up and paying attention to it, we've got something where on the whole it does a remarkable body of work. Yes, so one of the things I do when I teach is actually show a little film that Brad Bird first actually told me about. It's the extra material in the Incredibles, and it's this team fighting over various things, and really constructive conflict. And when I show it to executive audiences, which I do all the time, they say that's great, in our organization that would never work.

So do you have any - can it actually work some place other than Pixar? Okay, so I know we're running out of time here. Here's the thing, I have a lot of views about various things from failure and risk and so forth which I believe very strongly in. They can read the book if they want to read more. Yes. So but with all that theory I was also very aware that I am also subject to dilution just as other people can be or are, so we could be successful for reasons that we don't see because we're all together and we don't fully acknowledge what somebody contributes. But eight years ago, Disney came in and bought Pixar. And at that time they asked John and me to run Disney Animation. So we made the decision that we were going to keep these two studios completely separate. That they are not allowed to do any production work for each other whatsoever. So now we had a group that was failing and demoralized and led poorly.

So there were these great films of the 1990s, basically it was four, and they were culturally changing: the Little Mermaid, Aladdin, Beauty and the Beast and the Lion King. And then it went downhill. So we walk in and basically the process people have taken over and since process is important, they'd think about how to lower costs and get everything running smoothly and so forth. And they made bad film after bad film. So for us it's like how often do you actually get to take your principles and apply them to an entirely different group of people? And I knew almost nobody there. So we determined to turn them around. So we worked with them, we taught the principles, it took a while. The fact is all the stuff sounds good, but like a lot of things that sound good they depend upon trust and trust is something that takes a while to earn. And usually what it means is, you have to go through some screw ups together and some failures and mess ups, and then still be there for each other. And when you are there for each other you really begin to trust each other, then begin to apply the principles.

Now, they've made six films since we've been there, all six have been critical successes, and we dramatically altered everything from top to bottom in the way they thought about it and the principles and the philosophy. And then finally they had the big commercial success which was Tangled, which is the biggest film since Lion King. Then Wreck it Ralph was a big success, and Frozen just became the highest gross animated film in history. So here's the key thing. It's largely the same people who were there when they were failing. And the things that they couldn't do in terms of like being honest or candid with each other or figuring out how they thought about problems and failures, those same people learned those things and they

altered their behavior. They are a different group of people together. And it was actually an amazing and gratifying thing. It is amazing and gratifying. And the other thing is, because we kept them separate - like nobody could say - like they couldn't say Pixar rescued them and likewise Disney didn't bail out Pixar, because we kept them separate.

But they evolved into having very different personalities. The brain trust has a completely different mindset. But they're both extraordinary, they are the best groups that I know of and they are very different from each other. So the brain trust at Disney, as I recall from the book there is a brain trust, but when you pulled out the people who actually knew actually nothing about making films for example. That was one of the changes you make as I recall. Yes, when I got there above the director they had three levels of people who were giving mandatory notes. None of them had ever made a film before. So that's the first thing to go, you go to the director - you don't listen to any of their notes, you don't have to take our notes either. And that was a rather shocking thing for them, but we had to go through some training. So in fact what we did was we brought them up to watch a Pixar session, but we didn't allow them to say anything.

It's kind of strange really, but it was actually very effective. So the next day we all went down and looked at a Disney movie and our brain trust is there watching and they didn't say anything. But the brain trust there, according to the producer, gave the best notes they had ever given. That is, just seeing how it worked altered their behavior. So there's a thousand things in the book left - we have about 2 or 3 minutes. I want to do a quick one. So we can do it quick and then I want to ask you the Tina Seelig question. So the quick one is my favorite chapter, I specially recommend it's got this kind of weird name: The Hungry Beast and The Ugly Baby. So just to give us a little taste can you give us just a minute or two of what you mean by the Hungry Beast and the Ugly Baby. Because I think it's essential for managing innovation.

So it's a term I heard used at Disney, but it's used in other industries also. And that is, the bulk of your people are working on your products, it's a creative, active thing. And it is the group that generates your revenue, but it's also where your costs are. So I don't mean it's the Hungry Beast in the derogatory sense, but it's this beast that's got to be fed. Or think like the news or newspapers, right you've got to feed this thing. So upfront we have to generate new ideas, what happens with a lot of companies is after the founders go away or move on or get hit by cars or whatever happens to founders, the most organized people are the ones who run the beast. So they put those people over the whole thing and they bring the values to the upfront process which is okay let's go on schedule, let's get this, because we've got to feed this beast here. Our issue, and I think this is true in most places, is the very nature of what we're doing at the front is fundamentally different than when we're running the beast. We're doing something which is unknown, we're in wild territory, we don't what's going to happen and what we first do - or if I think of movies, people think making the movie sounds exciting, and it is exciting. But there's an imagination of what it must be like.

It's sort of like having this beautiful baby and that baby grows up to be this beautiful movie star. But what do you do if the baby is ugly? And that is our reality, is that the new ideas are fragile, they don't look good, they take protection, you cannot judge them at that point. You can see how well the team is working together but you can't judge the ideas. So we have to go from that stage to somehow with engagement with that beast and this is a long process but the normal thing that happens is people screw up the front-end. Okay. Now the Tina Seelig question and then get your questions ready. So Tina - where's Tina? I saw her somewhere. Anyhow - oh, she's waving way in the back. So Tina wrote a great book, What I Wish I Knew When I Was 20. So I'm going to ask you the Tina Seelig question.

So if you could go back to your twenties, you had quite a bit of experience. Think it's one of your early management sort of jobs, what advice would you give yourself that you wish you knew then? So, so this is - and I was asked this by a 20-year old at this road trip here. And I hadn't been asked it before. So, here's a difficult I've got is I've seen so many people whose income is at various stages. They believe they need to know what's right and they can't listen to the advice. So a lot of you have heard of the term cognitive bias? Confirmation bias. Oh, confirmation bias. Yes, confirmation bias. I think confirmation bias actually is not strong enough of an implication for what it is. Most of us have filters which take the words that we hear and frequently turn them into the opposite of what they mean.

It's not even selecting. It actually is warping them into something which is wrong. So then the question is okay could I have said anything to myself at 20 years - when I was 20 years - that would have made a difference. And honest to god I don't know. Because I sometimes talk with people and I tell them things there and actually even with the book, I go through some examples in the book of things which are I think important and I'll say here's something but the train of thought is that that thing which I thought was powerful, I later learned meant nothing Okay. So one of them is like the story is king. Like in our business story is king and we believe that, we gave it to or we said it but then I realized that every studio said that whether or not they were producing works of art or complete utter pieces of dreck. So the phrase didn't actually have any meaning. So my logic is then go to the next stage after that. But what I found was on a lot of the websites, people would refer to that as oh thank goodness you said that because that's really what I believe.

And kind of missing the deeper point is that sometimes those things that are true don't actually alter our behavior. And that's why I find it really hard to say what would I say to myself when I have to opportunity to talk to some people and I find that

some get it and some don't. So the question is am I the sort of person who would have gotten it or listened. Listened? To give you some subtitles and then we'll get to some questions. Randy Komisar-actually in the ETL a few years ago you can find the video-basically made the argument that as great as it would be to learn from other peoples' failures, they just don't have the same emotional impact. You got to have your own failures to really move forward which is I think a sort of part of what you are saying actually. Well it is. Other than having lived this, I don't know what to do. But I do believe that along the way because of the mentors and people I worked with, there was a view about mistakes and failure and trying things which did inform me. And having that philosophical view about how the world changes, how - what interdependence actually means and the full implication of that as well as and this the first conclusions are almost always wrong and so are the second and the third, right.

And to this day we are still finding things that we had concluded long ago actually are incorrect. In some cases they were incorrect then and we didn't realize it because we had overcome it because of other means. In some cases they were correct and they are no longer correct. No longer correct. Okay so we got 10 minutes - we should move to questions. Lots of hands here - so I guess I should repeat them because you guys don't have... So, yeas, talk loud. So in addition to creating these fantastic movies, I have heard from the book that you've established this remarkable cycle in which rapid advances in technology enable these new creative works that then feedback to accelerate the advances in technology, in computer graphics in this case. And I am curious whether it's getting any cheaper to establish cycles like this between new technologies and new kinds of creative works, or whether it's actually just more and more expensive now. Well basically probably more expensive, but the one thing to note about that is that the underlying technical base, that is the hardware, continues to change, the underlying software bases are changing and our expertise level and the workflows are changing.

There is nothing stable about it. And the reason you want to think about this is this loop between the artistic and the technical which I think it applies in a lot of areas, is a mechanism to deal through the instability of that and that instability is where we want to be. So all the way at the back. Yeah. I like the back. Yell. Can you speak a little bit about the balance between the art and the technology at Pixar? For example, are there ever tensions or conflicts between them, would you ever change the story and show case the science. Well - now the issue of showcasing the science would actually never be a point of conflict between the two. For me the issue is and I know this is true to a lot of companies because companies now are all realizing they have to involve technology but for most people, they are trying to bring it in. A lot of them they don't do it very successfully.

And for me the model is that you know you are an integrated company if you can't draw a line between the technical and the creative. Okay. Alright. And I would say that Pixar and Disney is there is no line between the two. So that kind of conflict actually - if you were to talk about that within that, that particular comment wouldn't make any sense. There are people who are purely technical and people who are pure artist but then they span this range. But whatever we work on and there are certain disagreements about a variety of things but it would never be about showcasing technology over the art. Okay. Hand right there. In another talk you mentioned that something really important is that while an organizational hierarchy might be necessary, it's good to avoid a communication hierarchy.

One of the tricky things about this is even if I am in the middle room Pixar and I know I could email you that doesn't necessarily mean that I will. So I'm curious to know what other manifestations there are, what other affect the crew after you've established that there is no communication hierarchy. Well, okay. So we say this to all new employees. Now the fact is because of peoples' emotional responses, that I know full well that there are certain things that I won't see or they won't say things to me. And I also know that a manager let's say at some level in the company has got objectives and goals and when you're in tight budget or schedule which is sort of the reality of our lives at all times, then you will give off body language which was don't do anything to disrupt it. So while this is a principle to strive for, there are deep, human personal emotion which get in the way all the time. So the reason we're talking about this is not to say oh, what you're going to have is a structure free information thing. That ain't going to happen, alright, but it means that you want that because you need the truth to come from anywhere and to be able to come out of order. So that means that you are continually - you've got a Sisyphian - is that the way you say it? I can't say it.

You have the - this is the Sisyphian task of continually rolling this up there because there's always a tendency to go back and to have the structure, the communication follow the organizational structure. So, the trick is to realize it's always going on even if you're doing a pretty good job of rooting it out, it keeps creeping back in. It's an endless job. Alright, let's see. Woman all the way in the back with the hand. Yell. Thank you. From your own experience, what do you think is the best about working? What lessons have you learned about? Well, I mean, teamwork is one of those things everyone says. It's good to work in teams. So I want to go beyond the obvious is to say that what we learn to look for is just whether or not that magic is happening in the team, when the team is clicking together.

And so we go through phases like you put a group together. It's good to have some people who have already worked together. If they've all worked together before then actually you've got a closed group which is now open. If there are too many new people there, they may go over the rail. So you actually want a balance of new people coming in. So that's your upfront

risk is how much new versus experience do you have within a group. Then you have to work things out there and sometime the group is collecting, they move along quite well. But a lot of times there are problems and now you've got this problem, if there are problems do people immediately raise your hands and say I have a problem. Well it's kind of the responsibility for the group to work things out and they feel like it's going out of school to go immediately up the ladder to say there's a problem here. But on the other hand, there really are problems that that will sink it.

So you've got this fuzzy thing where problems should be worked out in the group but sometimes they're not. So you need our people who are candid, have enough experience to say I want to raise a flag. So it's not blowing a whistle, it's not calling it to halt, it's just saying I think this isn't working as well as it should. So you get a couple of flags and you say, okay let's try some tweaking. So we will do tweaking and most of the time the tweaking which sometimes is adding a person or taking a person out is enough for the team to click into place. Sometimes that doesn't work and then we have massive failures and restarts. So we span the range there. But the only time we know it's going to work is when you actually feel that team working together. All the way to the right. Yes? Where do you see this industry in the next five to 10 years? Well since our films take five or six years to make then the five year part is the easier one.

We even have them scheduled out. But when I talk about the stability of it, obviously the mechanisms for distribution are changing. There are three different kinds of long format story telling. There's always been some very good long form television. There is the live action model for making films and there's the model that we use at Disney at Pixar. And we're embedded in an industry which is both changing the way we deliver and because it's going global, means that there is a, we're bringing in connections with the other parts of Disney and the outside world. So it is trying to make storytelling work. So that's the changing part. The thing that still is the same is the story telling is not just entertainment. It is the way we communicate with each other, the way we talk with our children.

We read to them, we tell stories. We read stories in the newspaper, we got articles, books, storytelling is our way of teaching and talking with each other. So that's always going to be there even though some of the form will change. So we're trying to be flexible enough to adapt to the things that are happening but believe we have a model based upon the way we as humans act. Last question. Yeah, right here. At Pixar in particular where do you enjoy spending most of your time? In the management sector or in the creative more of the storytelling and the animation and everything that goes along with that, or the technical research and development like the and all the projects there? Where do you find yourself enjoying the most time? Well the first thing to know is for me managing is a creating act and I define creativity very broad; it isn't just what some people think in terms of the artistic side. It's is problem solving and that our central problem is to try to remove barriers to that. And in addressing the barriers and the blocks and things that get in the way, then one has to think about the human nature that we've got and our differences and things that happen in other people that are very difficult for me to discern. And I find that very fascinating.

So that takes most of my time. So earlier in my career, I was very technically focused and now I'm very focused on what I think is a complex difficult problem and that is how we address these hidden problems that get in our way of problem solving. Alright so we're at the end. Just a sort of closing comment: I think in Ed's answers, you are seeing that you don't get glib management consultant or PR person responses. He thinks very deeply about the stuff that he does, much more deeply, frankly, than most business or consulting people I know. And that's one of the reasons that I found the book so fascinating from the very beginning. Because it really does reflect the sort of deep thought that you've seen from Ed here. So thank you so much for joining us, Ed, and thank you everybody in the audience. Thank you very much.