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FROM PIXAR'S KITCHENS

by

Galyn SUSMAN

Associate Producer of the Pixar Animation Studios film
Ratatouille

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Report by Noshua Watson

Overview

Pixar Animation Studios has a unique story development process, cutting edge 3D animation technology, and an extraordinarily talented crew which combines to make it one of the best animation studios in the world. *Ratatouille* is its latest critically acclaimed blockbuster about a gastronomically talented rat and the kitchen boy whom he coaches to culinary stardom while hiding under his chef's hat. Associate Producer Galyn Susman describes the details of the lengthy pre-production process that occurs before the actual animation begins. She shares "the Good, the Bad and the Ugly" aspects of managing story development, set and character design, animation, lighting, shading, editing and guiding Pixar directors who are given considerable creative freedom. She also discusses how the repeated mega success of Pixar's films creates a fear of failure that might hinder its artists' creativity in the future. Will the studio's ability to be flexible, creative and competitive in the future be in jeopardy now that the Walt Disney Company owns it ?

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TALK: Galyn SUSMAN

Her background at Pixar

I've been at Pixar for 16 years. When I joined Pixar it was predominantly a hardware producer. They made a box used for medical imaging and the software that ran this box was the very early version of RenderMan. Ed Catmull, one of the founders of Pixar and now the president of Disney Animation Studios, had aspirations to use computer graphics for entertainment purposes and recruited John Lasseter to come to Pixar for this purpose. John saw great potential in 3D graphics as a medium for animation. Thus the animation group at Pixar was born.

I came to Pixar when this group was just starting to do television commercial production. I did commercials for hire : Listerine, Tropicana and other brands. I was a "generalist" because I did technical work and animated and also produced, depending on the commercial spot. But our goal was always to make a feature film. Though we thought that we would need to start with something smaller, such as a television special, we had the unique opportunity to work with Disney, and the Toy Story effort began. I needed to make a decision on a career focus and chose to be a technical director and abandoned the animation and management aspects of the job. I spent the next decade doing strictly technical work : modeling, shading, lighting, special effects and working as a supervising technical director. Then I decided to go back to production management and became the associate producer on *Ratatouille*. I find it invaluable to have this in depth technical background as a producer.

Ratatouille and the Pixar Business Model

Production management is challenging at Pixar because the film making process is messy and chaotic. The difficulty comes from the scale and scope of what we are trying to manage. *Ratatouille* was six years from the initial story pitch to completion. It took more than 400 people and we created 199.880 frames for 111 minutes of film. Everything was created from scratch. Every object in the environment had to be designed and specified : the shapes, the movement, surface materials and how it responds to light. The complexity and richness in the images are designed and created by hand. All of this is done in the context of a constantly evolving story that puts varying demands on the characters and environments that are being built. The one thing that doesn't change is the deadline.

Pixar carries extraordinarily high overhead costs. This is attributable in large part to the fact that the staff is permanent, not run-of-show hires that can be dismissed when they are no longer needed. This along with the large number of people necessary to keep the facility running and our high software development costs and we spend approximately one dollar in overhead for every production dollar spent. This means that if we don't make a mega blockbuster, if our films don't make close to \$200M in the US or \$600M worldwide, we don't break even. We don't make a profit until we sell DVDs. This is not the most sensible model for a successful company. For a director can be intimidating.

Development and Story

Pixar is a director driven studio. We never say 'No' but 'How'. We are not a producer driven studio. Most studios say, "Here's the script. This is the movie you're going to make. Here's the amount of money that you have." And you work as a team to get the director's interpretation on the screen for that amount of money.

At Pixar, the directors do most of their own writing. Sometimes we will hire a writer to work with a director, but the story is the director's. Initially a director develops three ideas to present as rough story treatments to the "Brain Trust" : John Lasseter, and the other directors and heads of story. The process can be quite ruthless. You have to be a confident

and open artist to flourish in this process. It is only when John and the brain trust agree that a story is working that it will be given the “green light”, the go ahead for production.

Most directors have designers whose style and aesthetic they are familiar with, which is fortunate because at the beginning there is very little for the designers to work from. Usually some preliminary storyboards and a verbal description of characters and environments are all that they have. Over time they develop a visual language that works for the film but it takes a lot of iteration and collaboration between many different artists. There are on the order of 30 different specialties of art and artists that contribute to the design of a film. It is about two years from the time the story is first put up on storyboard reels until the start of production. This can be a lot of time for iteration, meaning a lot of time for director meandering if not well managed. It can also be challenging for a director to keep the story fresh for all of this preproduction time.

On any film we will have up to 15 story artists. They tell the story in a pictorial form conveying both the story ideas and the cinematography. Each artist has his or her strengths so sequence casting can be critical. Some artists are good at sensitive communication. Some are good at action or untangling a complicated idea and telling it through action, not words. All need to be able to draw on model, meaning that they must draw a character as the designers intend them to appear. A story artist may draw many hundreds of story panels for any given sequence. They pin these images on storyboards and pitch the sequence to the director, get feedback, make changes and pitch it again. Then they deliver the sequence to Editorial, which is the hub of the process. The editorial team is on the project from the beginning and they are the last people off at the end. Editorial will cut the story images together, time them, and add in scratch dialogue and temp music. The director reviews the sequence again, makes a fresh batch of notes and the sequence heads back to the story artist for fixes. For a single film, the story may be hand drawn five full times before this process is complete.

Production Design

The production design team is not just responsible for designing objects but more importantly for designing the essence of the world. For all of our films, we do a lot of research in inspirational environments to get a sense of what makes our film setting truly unique. Fortunately, *Ratatouille* was set in Paris. I had to come here three or four times on research trips and eat at Guy Savoy and La Tour d’Argent. But alas, I had to research the sewers as well.

We don’t try to recreate reality, so we need to design a coherent and consistent universe that will allow the viewers to suspend disbelief. If the characters are more realistic, then the environment has to be equally realistic. Even if you don’t know why something is wrong, inconsistency will prevent you from being able to immerse yourself. Three dimensions are much less forgiving than two dimensions. A viewer senses three dimensions as being more real, and expects some of the rules of the natural universe to apply. Breaking these rules by being too stylized or too extreme prevents the viewer from suspending disbelief. In total, there are about 15 designers doing character, set and surface design.

Set Design, Set Build and Dress

Everything has to be designed. We used real references and it was important to come here and photograph every French kitchen we could find. All of the chefs were very open and let us plaster ourselves against the walls and film an entire service. A French kitchen is fundamentally different than an American kitchen. The French model is a square kitchen with islands to work on. The American model is a more galley-style kitchen. So we learned how the stations work and we tried to reproduce it as authentically as we could. Even though we were not doing reality, authenticity was important.

The set designers are like architects who look at the story and try to determine what kind of space is needed and what props are necessary to both tell the story and build a compelling environment. You need spaces that have the traffic flow to allow for the story action as well as room enough to accommodate a camera. Even in computer animation there is a camera. It is a 3D camera that can be dropped into an environment, with lenses, focal lengths, etc. Of course if we need a wider lens, we can make a wall invisible, but we still need the angle. All of the elements within the environment need to be hand designed, the molding, the framing of the building, the woodwork. For every prop we start with reality and then decide how we want it to look in our environment.

All of these drawings are given to the people who are going to build the set on the computer using software like Maya or Softimage. We use our own system to apply surface shading ; the process of making wood look like wood and plastic look like plastic. There are also graphic artists who create every graphic element on the objects, from the covers of magazines and cookbooks to every label on every bottle in the spice rack. Every graphic has to be hand designed and legally cleared.

For sets with a lot of depth we will use matte painting. At a certain distance from the camera, there is no discernable difference between a matte painting and a rendered 3D environment, when the matte painter is talented.

There are people who are concerned only with the set dressing, focusing on the aesthetics as well as the prop continuity. It is important because if in one shot, a cup is here, then in the next shot it is over there, you'll notice. Everything has to be tracked. We have to have every element in a database with status information : is it designed, modeled, shaded, does it have any fixes outstanding ? It is only when every status of every object in a scene is complete that a scene can be rendered.

Character Design, Build and Shade

The characters are first drawn in concept until we have a design that we like and believe will work in the film. It is difficult to translate two-dimensional drawings into three-dimensional characters. Architects have experience with that, but most character designers do not. We enlist sculptors to reinterpret the drawings into sculpted 3D figures. Both drawings and sculpts are given to the people working on the computer to build and to articulate. All of the muscle motion has to be built by articulators. For every human, we try to use the same "rig" for both the face and the entire body. This gives a consistency to the animator that allows them to work more quickly. There are over 1.000 different controls on a character that an animator needs to manipulate, so having consistency in character behavior is important. These controls are hierarchical so that the animators can start with the basic ones and then work their way down the tree as they refine the motion, eventually using most of the controls given to them. Using these myriad controls to make lifelike motion is an art that is passed from one animator to another. The learning curve is high. If you come from a traditional animation background, it usually takes 6 months to a year before we can have you animating in a film. If you have 3D experience, it is closer to 3 months.

The shading art director creates painted reference for how a character should look when the surface shading is applied. Skin is remarkably complicated. It has a translucency that is different from anything else on the planet. For a rat, a large part of the shading is fur grooming. This is done by placing key hairs that indicate growth direction and hair length. For each rat there are approximately 300 key hairs. The hair program interpolates the rest of the hairs from these key hairs. The simulator is run on these key hairs as well to determine hair motion. The process for cloth is similar. We have tailors on staff taking measurements of the characters and designing uniforms that both fit and are assembled in a way that will allow the cloth to behave like real cloth once shaded and simulated.

Lighting Reference

The director of photography paints key reference paintings for every sequence in the film. This is the best tool to communicate to the lighting artists what a sequence should look like. At first a lead lightner takes a master lighting pass at a sequence establishing time of day and designing in all the major sources of light. Then the shot lightners will take this master lighting and apply it to the characters, adjusting to make the characters look good and read well against the background. In the end, the lit shot will look remarkable similar to the prelit painted reference.

The Editorial Progression Reel

All of this combined is considered pre-production. We are a good two years into the process and we are now ready to build sequences in layout and send them through the animation pipeline. Editorial maintains a reel of the current cut, taking the film from the edited story reel through the end of lighting, cutting in the results from layout, animation, simulation, FX, and lighting.

The Good the Bad and the Ugly of Production Management at Pixar

The Good : People management and process management. Our artists are very well taken care of. They feel that they get what they need to do the best work they can. Department managers feel that they have all of the necessary tools to determine whether they can deliver their part of the project on time.

We are good at finding simple solutions to complex problems. We take something that looks almost impossible to do and do it well. That includes creating fabulous looking pictures. The visual complexity leaves people stunned. They feel like they have seen art.

We are good at finding and nurturing the best talent. As long as you are producing good work, you have a job for life. We support the director.

The Bad: Project management. Almost no one has project management experience. Although the managers are good at their part of the pipeline, they're not aware of the impact on others when they are late. If the character designer is three weeks late, it is difficult to know how that will ultimately affect getting that character into a shot in animation half a year later.

We are bad at finding simple solutions to simple problems. At one time we figured out that it would take us 12 weeks to produce a frame of black, just getting it through the entire animation pipeline with all of the necessary reviews.

We are also bad at removing talent that does not fit because we are so artist-centric. It does not mean that the artist is not talented, but he or she may not be the right fit for what we do. By the time it became clear that the director who came up with the original idea for *Ratatouille* was not going to be able to successfully complete the film, it took 18 additional months to remove him and there were already 200 people working on the film. He had a great concept and vision in terms of what the picture should look like. But he was not able to be clear and decisive and bring the story together the way he needed to.

The costs of our films from *Toy Story* to *Ratatouille* have tripled. That's ultimately untenable if you want to be a profit making enterprise, which is what Disney wants Pixar to be. We create fabulous assets that are never seen because we allow the story to change up until the last minute. On *Ratatouille* we thought that half of the film would take place in the rat encampment in the sewers and we did one and a half years of work on what now shows up on the screen for two minutes. There were six main characters that were designed, built on the computer and then cut from the film. We created incredibly detailed models that only get seen from 100 meters away.

The Ugly : Fear. Every single film we've made has been screamingly successful. No other studio has that track record. It's a tribute to the process and the talented artists. But no director wants to be the first to fail. That trickles down to everybody. When the company saw *Ratatouille* for the first time, the people from the film that's coming out after us came up and said, "You bastards. What are we going to do now?" How do you keep an environment creative when you have a fear of failure and how do you possibly manage costs when everybody feels the pressure to do more? Whether Pixar will be successful for the next decade will be dependent on whether we can figure out how to manage this fear.

DISCUSSION

The Pixar Business Model

Question : *When you make an animated film, do you think about kids or adults ?*

Galyn Susman : We really make family films. Anyone of any age will find something in our film that resonates with him or her and makes it an enjoyable experience. We do not target a specific age but we do tell the story from different perspectives. In *Ratatouille*, what would be the perspective of a rat? How does the universe look when you're a tiny pinhole camera sitting at the floor and viewing a kitchen? How intimidating that is from the perspective of a small creature.

Q. : *How do you make a profit if you're losing money? And does Pixar produce the DVD?*

G. S. : When you do a release, you also have to recoup your marketing costs. Disney spends a lot of money on marketing, on billboards, bus painting, online and on TV commercials domestically. By the time the film is finished showing in theaters, if we're lucky, we've broken even. So DVDs and toys is where the cash comes in.

We put a lot of care into the DVD production because many more people see the film on the DVD than in the theater and the repeat customers are on the DVD. It's important that it is a quality product. The director says what he's interested in having on the DVD. There is bonus material and there is the in-house documentary crew that films meetings and the development process as well as doing interviews of the key artists. The directors enjoy the creative aspect of being involved with the documentary filmmakers and seeing the toy makers come in with the first designs. But getting them to look at some of the marketing material can be a little bit painful.

Project Management

Q. : *If the story keeps changing, how do you know that it will be successful?*

G. S. : It is always cut back together by Editorial and put on reels, so you can see it as it progresses. Then we do previews to audiences of different ages and based on responses make changes. We will do previews as late as eight months before the film's release. After the preview screening, the Brain Trust sits in the room together and the director hears all of the feedback. Ultimately it's up to the director to decide what to do with the feedback.

Q. : *How do you handle difficult creative decisions and disgruntled artists? Also ideally, the film should be 90 minutes, so do extra minutes mean weak management on your part?*

G. S. : When it's in the service of a better story, making a cut is okay. Some artists need more hand holding to be okay with it. We have had only one case recently where someone was so disgruntled that they left Pixar. The animators may be insane but they are ultimately the most regimented because an animator has to produce four and a half feet a week. That

ability to be creative on demand for 11-13 months non-stop is incredible discipline. It helps them to accept when their animation is cut for story reasons.

The extra minutes happen because the director wants the time to tell the story. He or she makes the decision to continue with a thread of the story, embrace its complexity and tell it well. Sometimes it is bad management. I think we could do a better job early on of saying that the story is too complicated. But anywhere between 90-95 minutes is fine. I think *W.A.L.-E*, our next movie, is running around 92 minutes. *Ratatouille* is 111 minutes. That is way too long.

Q. : *What do you do as a producer ? What do people do when they're not on a project ?*

G. S. : I work with the director to figure out what he needs to do to get his vision on the screen. It's determining how many people, what type of people, what kind of software, what teams need to come together, what pipeline and what infrastructure. On a daily basis, I'm both a resource for the director, asking, "What are you worried about today," and I sit in daily reviews with the director and say, "Do you really need that change ? It's going to take another week." The artists and animators will never say no. So the producer has to be the voice of reason.

Artists are usually working on a film. But generally speaking, they only work on one film at a time due to creative constraints. For example, on *Ratatouille* the DP developed an entirely different lighting model to achieve the painterly affect. The next film is much more photo-realistic, so it has a totally different look. One lighter can't really work on both of those films at the same time. In between films, people take holidays, help with the odd work that comes up, and sometimes spend several weeks hitting the studio overhead budget.

Q. : *Do you know how expensive a film will be ? Can you reduce the expenses ?*

G. S. : We can estimate the budget to within \$10M in the beginning, but we seem to always run into extenuating circumstances. When you have to fire a director and start over, like we did on *Ratatouille*, there's no way to anticipate those costs.

The biggest impact on cost is the length of the film. The cost per minute is very high for layout, animation, simulation, effects, lighting and rendering. You're talking 150-200 people for those teams and for every minute of the film, you extend them for 3-4 weeks. We make family films and the attention span of a child is about 90 minutes. If your film is 90 minutes long, you also get an extra showing per day in the theater. Your box office opening numbers are directly related to how many showings you have that first weekend. It feeds on itself and everybody starts to come in to see the movie.

We are constantly doing software development to try to increase the speed or interactivity or make the tools better. It allows us to make a better creative product. We can iterate more. But we don't use the savings to cut back the time invested even though if you reduce the man-weeks, you can reduce the costs. We could improve our overhead by not doing software development, but that is probably not the right tradeoff.

So the best way to reduce man-weeks is to only make a 90-minute film and to lock the story ahead of time so that we only make the film once instead of two times. If someone could get the story right the first time, that would be ideal. If not, better to have a great story.

Business Management

Q. : *It took six years to do Ratatouille. If you have multiple projects, how flexible are you ?*

G. S. : We do a film every year. The film after us is very fixed. It's called *W.A.L. L -E* (pronounced "Wally"). After that is *Up*. It's in pre-production. *Toy Story 3* is in development now. There is some internal competition between directors in development to get the next spot after that. We have three or four directors in development and the one that has the most viable story will be the next one to go. No director wants to make a movie once every seven years so there is a bit of competition for the spots.

Q. : *What's the workplace like ? Are the employees well paid ?*

G. S. : It's not serious at all and it's an easy place to be creative. There's a gym and a soccer field and a foosball table and a pool table. In the main building alone, there are six bars. The talent there is extraordinary. But you have to get them to focus and get their work done without being workaholics. It's not good for their long-term health or the health of their families.

We pay around the average. But all of our employees are shareholders and that was maintained when Disney acquired us. Stock options are a large part of our pay package, but there are no incentives by minute. This all goes back to Steve Jobs, the Apple CEO and former CEO of Pixar. He is the ultimate egalitarian. It takes everybody to make the film, so everybody will share the profits. Within a few months, they can determine how much the film is going to make at the box office over its lifetime and they determine what the bonus pool will be. Everybody shares in that bonus pool and receives x number of weeks of pay, whether you worked on the film or not.

Pixar's Future

Q. : *Does the fear come from an economic or an artistic threat ? Would it be good for Pixar to have stronger competition ?*

G. S. : To be successful at Pixar, you have to make a mega blockbuster and that's a difficult environment to be creative in. I am worried about managing the creative fear because it can constrain creativity. You can become formulaic and we worry about the economic impact of that.

There are people who make a high-quality image for much less money than we do. But where we need more competition is in the story domain. Computer animated films are getting a very bad name because there is so much dreck out there. People don't want to go to see many of the animated films because the odds are that they won't be very good. If Pixar produces a film that is not good, we may get lumped in with the other dreck. It's not clear how forgiving our audience will be.

It is bad business to make bad movies. It's difficult as a parent to find good movies to take your children to. If there were more of them, it would be good for the industry. Would an improvement in the industry help us ? Now that we're a part of Disney, I don't know if we would actually be lithe enough to respond. We are very, very big now. We have certainly lost some of the flexibility that we had when we were an independent studio.

Q. : *Do you have a senior manager who is willing to take risks ?*

G. S. : There is John Lasseter, the creative head of Disney Animation. He is definitely not risk averse. He is very creative and he is very good at giving creative feedback. He is very powerful. My concern in relying on John or Ed Catmull, the President of Pixar and Disney Animation Studios, is that they are no longer representing only Pixar. Pixar is doing well, so their focus has shifted to helping Disney fix itself. Disney dismissed its 2D animators and decided they were only going to do 3D. But you can't just snap your fingers and have a 3D studio. So now they have neither. They didn't fix the story problems either. So John and Ed are working hard to help bring back an authentic Disney. I don't know how they can give time and energy to that and also give to Pixar.

Q. : *What was it like to have Steve Jobs as a leader ? Did he push you to increase the level of quality with each film ?*

G. S. : He certainly wasn't afraid to take risks. He paid for Pixar out of his personal bank account and paid salaries for almost 100 people for two years. His belief is the reason that we got to the place where we could make our first film. That and his marketing genius.

Whether you look at our long format films or our short films, there is a recognizable feeling. I think that having the Pixar "image" was the intent all along, going back to Steve's vision of Pixar as a full studio, not just a production company. I don't think that we are

quite there yet. But we hope to always stand for quality family entertainment. If one of our directors wants to do something quality, but not family entertainment, I don't think it will be produced at Pixar.

Steve really left the making of the films to John and Ed. He was more like the benevolent grandfather. He'd come to save the day. He'd say, "It's a beautiful idea and I think it will work, so I'll give you more money." Every once in a while, he'd say, "What are you doing? It's a piece of junk!"

About four years ago, Pixar was about to go completely independent from our distribution and marketing deal with Disney and do it on our own. We were considering having someone else do the distribution, but we would do everything else, including all of the marketing. Then Steve was diagnosed with cancer and upon his recovery I think he realized he needed to do only one company and spend more time with his family. Pixar was sold to Disney. He's the largest individual shareholder of Disney. He sits on the board and holds an enormous amount of sway. But he's no longer involved in the day-to-day workings of Pixar.

Q. : *How is your relationship with the Disney people ?*

G. S. : Our cultures are very different. Disney is an exceptionally hierarchical corporation. The biggest problem we have is reading the Disney politics. Pixar is not a very hierarchical or political place. As a producer there are three levels between myself and one of my animators. There is only one level between me and the president of the company. But once you work with specific individuals, ways are found to bridge the different working styles. As individuals we all want the same thing, which is to do the best job possible.

Presentation of the speaker :

Galyn Susman joined Pixar Animation Studios in November of 1990, and worked on Pixar's TV commercial production as technical director, animator, and producer. Then she served as technical staff member on feature films: *Toy Story* (modelling, shading and lighting supervising), *A Bug's Life* (modelling), *Toy Story 2* (supervising technical director), *Monster's Inc.* (simulation and effects supervisor). Most recently, Galyn was the associate producer for *Ratatouille*. She is currently the producer for the DVD-Promo Department at Pixar. Before arriving at Pixar, Galyn was conducting graphics research and development at Apple, where she was a part of the team that made a short film entirely on Macintosh computers. This project was one of her early influences to have made her choose her current career.