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**"Love, Death and Robots" Season 3 - "The Golden Witch (Jibaro)" Segment
Production Cost and Project Management Case Study**

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Introduction

With the development of digital animation technology and streaming platforms, the production of animated short films is gradually approaching the standards of the film industry. Netflix's "Love, Death & Robots" explores diverse visual expression methods through different directors and teams. Among them, the third season, "Jibaro", stands out as one of the most talked-about works in the entire season due to its highly experimental cinematography style, complex character movement designs, and highly impactful visual language.

"Golden Witch" was directed by Alberto Mielgo. The film tells a story about a deaf knight and a golden witch, centered around desires, greed, and destruction. The movie extensively uses close-up shots, dynamic photography, rapid editing, and complex environmental interactions. Its visual style combines live-action photography with digital animation technology, creating a form of expression that lies between reality and dreams.

Based on the experience of the animation production industry, the costs of highly complex shots tend to be concentrated in areas such as character creation, dynamic systems, visual effects, and post-production rendering (Kerzner, 2018). Therefore, this article analyzes the production logic of "The Golden Witch" from four aspects: the overall cost composition of the film, character modeling techniques, shot budgets, and professional highlights, in order to explore the industrial processes behind digital animation projects.

1. Overall cost composition

Based on the publicly available information in the animation industry and the budget scale of Netflix's original animation projects, it is estimated that the production budget for the third season of "Love, Death and Robots", titled "Jibaro", is approximately between 3 million and 5 million US dollars. As an experimental animated short film directed by Alberto Mielgo and completed by a high-quality digital animation team, its production specifications have approached those of a film-level CG project. Although the film is only about 17 minutes long, due to its extremely high visual density, complex camera movements, and a large number of dynamic special effects systems, its production cost per unit time is much higher than that of ordinary animated short films. The funds for the film are mainly concentrated in the following core parts:

1.1 Special effects and animation production (accounting for approximately 55% - 60%)

Visual effects are the core technical highlight of this film. Especially in the texture shaping and dynamic behavior presentation of the fully CG character "Golden Witch", a large amount of manpower and computing resources were consumed. The Blur studio employed approximately 220 special effects artists, mobilized over 8,000 rendering devices, and the total rendering time exceeded 86 million hours. The budget for this section was as high as 1.8 million to 2.7 million US dollars.

In addition, the film uses a large number of motion blur, particle interaction and environmental dynamics effects in its shots. The rendering time for a single frame is significantly longer than that of traditional animation works. Some complex shots may require hundreds of rendering devices to work in parallel to complete the final output.

1.2 Shooting and on-site construction (accounting for approximately 20%)

Although the short film is centered around CG content, some scenes such as the interiors of the starships and the surface environments of the planets were still produced using a method that combines basic model building with digital rendering. It is known that the core scene design work was completed at the Los Angeles production base of Blur Studio. The production team created a digital scene asset library with an area of approximately 2800 square meters,

covering core visual elements such as alien landscapes, scientific research equipment, and starships. The costs for this part mainly include the salaries of the designers, the licensing of asset development tools, scene refinement and adjustment, and other related expenses.

In addition, pre-visualization of photography and camera movement tests are also significant cost drivers. Based on the experience of virtual production processes, this portion of the budget accounts for approximately 20% of the total budget.

1.3 Actor compensation and human resources (accounting for approximately 10%)

Although "The Golden Witch" did not adopt the traditional star-actor system, the character movements and physical designs still relied on reference to real actors' performances. The characters' movements in the film showed distinct dance-like and performance-like characteristics, so during the production process, there might have been involved action actors, dance directors, and character performance designers.

Meanwhile, the production of animation projects heavily relies on the collaboration of the technical team, including: Animator Binding Engineer Character Modeler Lighting technician Special effects programmer Render Engineer.

Kerzner (2018) argues that in large-scale creative projects, human resource management typically determines the efficiency of project execution, and the investment of technical personnel often constitutes a significant part of the fixed costs of the project.

Furthermore, the visual style of "The Golden Witch" falls under the category of non-photorealistic animation, which demands high standards from the art director and technical team (Rall, 2018).

Therefore, it can be inferred that the cost of human resources accounts for approximately 10% of the total budget.

1.4 Post-production and music and sound effects (accounting for approximately 5%)

The post-production of the film mainly includes shot composition, color correction, sound design, and music production. The sound design of "The Golden Witch" is highly experimental at the narrative level. The film changes the way the audience perceives sound by setting the knight as deaf, allowing environmental sounds, water flow, and character voices to all contribute to the narrative structure.

Furthermore, in the later stage, the following tasks need to be completed: Dynamic Blur Processing Adjustment of shot timing Digital synthesis Uniform color scheme Final Output.

Manovich (2001) pointed out that digital image post-production has become an important component in the formation of visual style, rather than merely a technical refinement stage.

Although this part of the budget accounts for a relatively small proportion, it plays a crucial role in the final visual presentation of the film. Therefore, the budget is expected to account for approximately 5% of the total.

2. Analysis of the Construction of the Core CG Character in the Film - Taking "The Golden Witch" as an Example

The creation of the core character, the Golden Siren, is one of the most technically complex and resource-intensive parts of the entire short film. Unlike traditional CG characters, the Golden Siren not only serves the narrative function but also undertakes the task of visual style construction. Therefore, the character production needs to achieve the unity of character performance, complex material systems, and environmental interaction effects.

The entire character creation process can be divided into two core stages: action reference and expression of demeanor, as well as character modeling and material system construction.

2.1 Dynamic reference and expression restoration

Although "The Golden Witch" did not fully employ the complete traditional motion capture workflow, director Alberto Mielgo emphasized in an interview that his creative approach heavily relied on live-action performances, photographic references, and post-production animation processing, in order to retain the "unstable human quality" of the characters and their strong emotional expressions (Animation World Network, 2022).

The production process usually involves: Reference for live-action performance High-speed photography recording Analysis of action breakdown Manual adjustment of keyframe animation

Unlike traditional motion capture which focuses on achieving precise movements, "The Golden Witch" places greater emphasis on the imbalance, randomness and emotional changes in the characters' movements. This approach makes the character movements more akin to dance and physical performances rather than the standard animation movement patterns (Williams, 2009).

In terms of the character's expression and demeanor, the Golden Witch is not an ordinary human character. The character's body is composed of complex metal structures, accessories, and dynamic elements. Therefore, the character's expressions not only depend on facial changes, but also require the combination of body movements, camera movements, and environmental feedback to be completed.

"Expression" is an important window for establishing the emotional connection of the characters. The changes in the golden female demon's state from mysterious and vigilant to

emotional outburst in the film are continuously reinforced through the characters' actions and the language of the camera, giving the characters strong memory points.

Therefore, the final visual effect of the characters is not only dependent on technical precision, but also on the collaborative relationship between animation performance and artistic design.

2.2 Character Modeling and Material Textures

The most distinctive visual feature of the Golden Succubus comes from its highly complex metal material system. The character's surface is composed of numerous gold ornaments, chains, and jewelry structures, and it continuously generates dynamic reflections and environmental feedback during movement (CGWorld, 2022).



In computer graphics, the creation of metallic materials typically involves: Surface Reflection Refraction Subsurface Scattering Dynamic Lighting Feedback.

Since the golden female demon needs to simultaneously exhibit both the sense of life and the metallic properties, its material system is more complex than that of ordinary characters.

During the movement of the character, the metal surface not only needs to reflect environmental changes, but also needs to show the dynamic feedback under the emotional state. Therefore, the character's material is no longer just a static texture, but has become an integral part of the character's performance.

Apart from the material, the dynamic interaction between the characters and the environment is also an important aspect of character creation. In the film, the golden female demon needs to continuously generate jewelry collisions, water feedback, and body dynamic changes in scenes where it comes into contact with the characters (fxguide, 2022).

This production method involves: Environmental interaction system Dynamics simulation Collision detection Particle feedback system.

According to the animation production process, the real-time interaction between

characters and the environment can significantly enhance the realism of the scene and the immersive experience.

Therefore, the production team needs to establish a complete dynamic feedback mechanism, enabling the characters to undergo a continuous transformation process from a static form to a high-speed dynamic form.

3. Analysis of lens professionalism and key budget investment

"The Golden Siren" employed a highly stylized photographic language during the process of shot creation, combined with live-action photography references, dynamic shot rehearsals, and a digital shot planning workflow, enabling the director to continuously adjust shot composition, character positions, and movement paths in a digital environment, thereby achieving a unity between shot orchestration and visual expression in complex scenes.

Unlike the stable shot language of traditional CG animation, "The Golden Witch" extensively employs handheld camera styles, rapid zooming shots, and irregular movement trajectories. Director Alberto Mielgo hopes to enhance the audience's immersion and emotional impact during the viewing process by simulating the "out-of-control" feeling found in real photography.

The production team conducted extensive pre-visualization and animation tests during the early stage, repeatedly adjusting the character movements, shot paths, and spatial relationships to ensure consistency between visual logic and narrative rhythm. According to behind-the-scenes materials, the director spent a considerable amount of time on the early visual development and storyboard design to establish the unique shot language system of the film.

In the forest and lake scenes, the film extensively employs high-speed moving shots, close-up tracking, rapid perspective changes, and dynamic tracking techniques. This lens design further enhances the emotional fluctuations of the characters and the sense of spatial oppression, enabling the audience to more directly perceive the conflict relationships between the characters.

During the production of "The Golden Witch", the budget was mainly allocated to visual effects, character animation, dynamics simulation, and post-production. Although Netflix did not disclose the actual production budget for this short film, based on the scale of high-quality CG short films and the production standards of the "Love, Death and Robots" series projects, the overall budget is likely to reach the millions of dollars level.

Among them, high-complexity shots require the simultaneous handling of various visual effects such as character animations, gold jewelry collisions, water body simulation, particle systems, and motion blur. Complex shots usually require a large amount of computing resources and long rendering times, thus becoming one of the technical sections with the highest budget investment in the project (Williams, 2009).

Cost Component	Unit Cost Estimate	10-Second Cost (24 fps)	Segment
Character animation (including expressions and motion capture)	40,000 - 60,000 US dollars per second	400,000 - 600,000 US dollars	
Scene modeling and interaction effects	0.8 thousand - 1.5 thousand US dollars per second	80,000 - 150,000 US dollars	
Rendering and lighting production	20,000 - 30,000 US dollars per second	200,000 - 300,000 US dollars	
Synthesis and Color Mixing	5,000 - 8,000 US dollars per second	\$30,000-\$50,000	

"Female Demon vs. Human on the Surface" 10-second scene cost breakdown

In fact, the pre-production period of "Jibaro" was relatively long, and its production depth was relatively rare among short animated works. According to the behind-the-scenes interview materials, director Alberto Mielgo conducted long-term concept development and visual experiments before the official production began, and independently completed a large amount of pre-animatic and shot design work. The director mentioned in the interview that the visual exploration and animatic design stage alone lasted for a considerable period of time, in order to ensure that the work could form a unique visual style and narrative rhythm.

The concept design of the short film mainly focused on character designs, scene styles, and camera language. Since "The Golden Witch" emphasizes the combination of realistic photography and painting styles, the character designs, forest scenes, and spatial relationships in the lake area all underwent multiple rounds of visual testing and iterative development . Different from the traditional animation process, the film places greater emphasis on the connection between camera rhythm and visual emotions.

On the technical side, the production team extensively utilized real actor reference, photography tests, and animation previsualization processes to support character animation and the design of complex shots. The director did not fully rely on traditional motion capture systems but instead adopted a method combining real actor reference with hand-drawn keyframe animation, thereby preserving the randomness and realism of the character movements.

Dynamic reference shooting, digital asset production, and environment development work are mainly concentrated in the formal production stage. After the character animation is completed, the production team continues to carry out work such as environment refinement,

shot adjustment, and special effects overlay to ensure a unified visual logic between the characters, shots, and scenes . Compared to ordinary animated short films, the production cycle of "The Golden Witch" is significantly longer, reflecting its higher artistic and technical investment.

Firstly, the visual effects section accounts for the highest proportion of the production cost. The film involves a large number of character animations, particle systems, water body simulations, and dynamic accessory systems. Especially for the Golden Witch character, the surface of her body contains numerous metal ornaments and accessories, and the movement process requires complex collision detection and dynamics calculations, which significantly increases the production difficulty.

Secondly, character dynamics and expression of emotions are also significant components of the budget allocation. The Golden Witch is not a traditional CG character; her character portrayal relies not only on facial animations but also on body movements, camera movements, and environmental feedback to jointly convey emotional expressions . To enhance the authenticity of the performance, animators need to repeatedly adjust the character's movements and key frame details to strengthen the character's vitality.

In terms of camera production, the team employed digital camera preview and dynamic photography design methods, enabling the director to continuously adjust camera positions, movement trajectories, and character relationships, thereby enhancing the visual coherence of the shots. Additionally, the film extensively utilized forests, water bodies, and complex natural environments, thus requiring the establishment of a complete digital asset system to support scene construction and environmental interaction.

Post-production, sound effects and music also account for a certain proportion of the budget. The sound design of the film is highly experimental, using the character's deafness as a means to control the audience's auditory experience, making sound an important part of the narrative.

In conclusion, the film's budget was mainly allocated to core technical aspects such as visual effects, character animation, and shot design. Reasonable resource allocation not only ensured the visual quality of the work but also enhanced the narrative expression and immersive experience of the film.

4. Professional analysis of the highlights

In "The Golden Siren", the lake chase and dance of death scene is considered one of the most visually and technically complex parts of the entire short film. From a narrative perspective, this segment not only serves as the climax of the plot but also represents a concentrated expression of the film's visual style and character conflict. The scene requires the Golden Banshee and the knight to undergo emotional shifts from mutual probing and attraction to escalating conflict within the forest and lake environment; therefore, character movements, camera work, and environmental feedback require a high degree of coordination.

From a character presentation perspective, the Golden Banshee is not a traditional CG character. Her body is covered in numerous gold ornaments, necklaces, jewels, and dynamic accessories. Therefore, her movement not only needs to depict the character's own actions but also requires the simultaneous handling of collisions, swaying, and environmental feedback between hundreds of dynamic elements. Especially during high-speed rotation and running, the accessory system, hair, cloth, and water particles all need to participate in the simulation, significantly increasing the complexity of the shots (Kerlow, 2009).

In terms of special effects, the film extensively utilizes particle systems, water simulation, dynamic depth of field, and motion blur techniques to enhance visual impact and spatial realism. Especially in the lake scenes, the continuous interaction between characters and water necessitates the simultaneous calculation of multiple systems, including water splashes, reflections, environmental disturbances, and character movement trajectories. According to the CG animation production workflow, highly complex shots typically require simultaneous character animation, dynamics simulation, and rendering calculations, making it one of the most expensive technical aspects.

It's worth noting that *The Golden Banshee* didn't rely entirely on traditional motion capture systems. Instead, it employed a combination of live-action motion references and hand-crafted keyframe animation. The director believed that relying solely on motion capture would weaken the "human instability" in character movement; therefore, the team enhanced the characters' performances through a combination of live-action references and manual adjustments (Animation World Network, 2022).

As a result, from character animation to environmental interaction, from dynamic systems to camera design, the core scenes of *The Golden Banshee* demonstrate a high degree of technological integration and artistic expression. This highly integrated production method not only shaped the film's unique visual style but also became an important case study in visual

experimentation for animated short films in recent years (Raii, 2018).

Conclusion

As a significant representative of stylized digital animation in recent years, *The Golden Banshee* demonstrates extremely high technical complexity and artistic exploration value in character creation, camera design, and visual effects. Although the film has a limited runtime, its production process approaches the standards of a film industry-level CG project. The overall budget was primarily focused on core aspects such as character animation, motion systems, environmental simulation, and post-production, reflecting the production team's high regard for visual expression and narrative experience.

During the creation of the core scenes, the character of the Golden Banshee received the most concentrated technical investment. The character not only needed to achieve complex movements but also had to handle numerous metal ornaments, body dynamics, and environmental feedback systems simultaneously. To achieve unity between the character's movement and emotional expression, the production team used a combination of live-action motion references and hand-crafted keyframe animation, enhancing the character's realism through complex material systems and dynamic simulations.

In terms of visual effects design, the film utilizes character animation, water simulation, particle systems, and dynamic lighting rendering techniques to construct a visual experience that combines realism with artistic style. Complex shots often require simultaneous processing of character movements, environmental interactions, and camera movement logic, thus each frame involves extensive animation adjustments, special effects simulations, and rendering calculations. This highly integrated production process not only enhances the film's visual quality but also poses new challenges to traditional animation industry processes.

Furthermore, the director blends realistic cinematography with experimental visual expression in the shot design, employing handheld camera work, unstable shots, and rapid perspective shifts to achieve a unique balance between narrative pacing and visual immersion.

Overall, *The Golden Banshee* not only showcases the advancements in digital animation technology but also demonstrates the trend of fusion between artistic expression and industrial production in stylized CG works. Through a meticulous production process and highly collaborative technological integration, the film proves that digital animation can effectively unify narrative depth and visual innovation, providing a new reference direction for future animation project management and industrialized production.

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FINAL GRADE

62/100

GENERAL COMMENTS

The work demonstrates a sound understanding of the production complexity behind *Jibaro*, particularly in relation to the likely areas of budget concentration.

The discussion of character animation, metallic material systems, dynamic accessories, water simulation, particle effects, lighting, rendering, compositing and post-production shows a clear awareness of how technically demanding CG sequences affect production cost.

The budget breakdown is speculative, but it is approached in a reasoned way and supported through some relevant production and project management sources. The inclusion of percentage-based cost categories and a focused 10-second sequence breakdown is useful and shows engagement with the central production management focus of the task.

To improve further, the budget analysis would benefit from clearer working, more consistent evidence, and a more professional tabulated structure showing how individual production roles, pipeline stages and technical requirements directly influence cost.

There are also some inconsistencies in terminology and factual detail that reduce the overall clarity and reliability of the report. While the work addresses production breakdown and budget awareness reasonably well, it gives less attention to scheduling, crew allocation and communication elements, which limits the overall mark.

Overall, this is a sound Level 7 submission with clear production awareness, but it requires greater precision, structure and evidence to move into a stronger merit or distinction range.

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