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Mental AND Natural: Building a Cloud-based collaboration Platform in China

Professors Xiaomei (Monica) Li and Lawrence A. Plummer wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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Entrepreneur Jason Wang summoned his leadership team—a group of skilled artists and multimedia experts he called his “brothers”—for a meeting to talk through a major decision. Mental and Natural Company (M&N)—the digital multimedia company founded by Wang in 2011 in Tianjin, China—provided a range of services, including animation, visual effects, film digitization and restoration, software and multimedia training and certification, and related research and development (R&D) services to companies inside and outside China. In late 2016, wanting ready access to China’s best multimedia talent and expertise without burdening the company with an excessive number of employees, Wang and his team had begun work to develop a cloud-based multimedia crowdsourcing and collaboration platform. The collaboration platform would allow M&N to quickly and easily crowdsource the needed freelance talent from around China, provide training if needed, coordinate the work of complex projects, and process payments for the work provided.

In early 2017, after learning of the new collaboration platform under construction, outside interests from China’s Ministry of Culture and Ministry of Commerce presented M&N with a growth opportunity. Wang and his team were asked to consider three options for growth: allow M&N’s competitors in China use of the collaboration platform, allow other industries in China use of the platform, or allow companies around the world use of the platform to access China’s freelance talent. As with many entrepreneurial opportunities, they did not have much time to consider the options. In fact, Wang and his team had only a few weeks to decide—well before the platform was even operational.

**THE BIRTH AND GROWTH OF MENTAL AND NATURAL**

After decades of developing and accumulating personal expertise in advanced computing, computer graphics, and digital multimedia, Wang foresaw a huge potential in domestic and foreign demand for high-quality 4K ultra-high-definition (UHD) digital multimedia services and technologies.[[1]](#footnote-1) As a result, in 2011, Wang founded Mental and Natural in a rented house in the Nankai district of Tianjin, China (see Exhibit 1). Although the company’s initials, M&N, derived from the company’s focus on digital multimedia and networks, the full name of the company referred to the company’s technical smarts and the artistic beauty found in nature.

In M&N’s early days, Wang and his team worked with MTI Film—a leading digital film restoration company in Hollywood—to undertake UHD digital restorations of classic Hollywood movies. After a year of working on several restoration projects, Wang increased the company’s investment in new personnel, production equipment, and related R&D. The company’s R&D efforts led to the development of new technology and software to facilitate and speed the technical and artistic collaboration needed for most digital multimedia projects. Among the early developments were M&N’s two proprietary image and model annotation software systems, which allowed people working on the same project to coordinate their efforts by attaching comments and instructions to individual digital images. On the hardware side, M&N had developed a portable 4K UHD graphics workstation, for which it had applied for a patent.

Recognizing the need for digital multimedia training in China, in 2012, M&N developed a relationship with The Foundry Visionmongers, Ltd. (Foundry)—a global digital multimedia technology company headquartered in London, England—and became Foundry’s only authorized education and digital technique management centre in China. In addition to setting up an online training and certification program for Foundry’s digital image compositing system, M&N was also in charge of writing, publishing, and authenticating Foundry’s textbooks and related educational works authorized for use and sale in China. In 2014, M&N expanded its online training to offer its first massive open online course (MOOC) and began working with universities to provide undergraduate digital multimedia education for university credit. It also developed a professional certification system for multimedia artists and technicians. Through its efforts, M&N had the capacity to train more than 2,000 students annually.

M&N had another key development in 2012. The company began co-operating with the National Supercomputer Center in Tianjin (NSCC-TJ) to develop an UHD remote-access digital rendering and data processing platform. The remote-access platform would support Tianjin’s National Animation Industry Park, founded by the Tianjin Municipal Government and the Chinese Ministry of Culture, and would allow the park’s resident animators—and M&N’s competitors—online access to NSCC-TJ’s tremendously powerful computing facilities.[[2]](#footnote-2) M&N then created its own proprietary online remote-access production system called the Magnet Cloud. The Magnet Cloud allowed freelancers hired by M&N to work on projects on the company’s servers rather than downloading images to their personal workstations. M&N would file for a patent and registered trademark for the Magnet Cloud.

As M&N continued to develop the remote-access platforms and advance its training programs, the company dispatched staff to the United States and Canada to complete advanced studies in digital multimedia, computer graphics, and related technical standards. Wang also worked to develop M&N’s opportunities beyond China. By 2015, M&N had launched its North American R&D centre—a division of the company located in Montreal—to lead M&N’s relationships with local research centres and the National Animation and Design Centre, Canada (known in Montreal as *le Centre National d’Animation et de Design*). In early 2017, M&N signed several co-operative agreements with high-profile Montreal-based companies to provide training, visual effects (VFX), animation, and underwater photography.

By 2017, M&N began work on its 4K UHD film and animation production crowdsourcing and collaboration platform. While NSCC-TJ’s remote access platform and M&N’s Magnet Cloud platform allowed skilled digital multimedia technicians and artists to work on various projects, neither platform could coordinate collaborative work, provide training, manage the quality of the completed work, *and* process payments for completed work. Thus, the collaboration platform would mesh M&N’s production, annotation systems, training and certification, and remote-access capabilities into a single cloud-based system.

**M&N’S FOUNDER AND HIS TEAM**

Wang earned an undergraduate degree in Fine Chemical Engineering from Tianjin University in China in 1999. During his second year at university, Wang started to learn 3-D animation and filmmaking from the book, *Inside Softimage 3D*[[3]](#footnote-3)—the only introductory book on digital graphics and animation available in China at that time. Wang found that he had a strong interest in digital animation, but with no animation or graphics instruction in China at the time, he taught himself largely by trial and error.

From the age of 10, Wang had a long-standing passion for entrepreneurship and innovation. As a teenager, while working with his father to drill a series of holes in a wall, he was inspired to invent a self-levelling ruler to help with the task. Then, as a university student, he started several small businesses to support his studies, including a small shop offering printing, DVD, and video production services. After university, Wang took a well-paid sales position at DuPont, but after only a year, Wang felt little passion for the job. So, he resolutely quit and decided to follow his dream of being an entrepreneur.

Wang was greatly influenced by Taoism, a religious and philosophical tradition of Chinese origin that emphasizes living in harmony. Wang believed that people must place their will in harmony with the natural universe so that any potentially harmful interference may be avoided; in this way, goals could be achieved effortlessly. Wang summarized his personal philosophy in four words: Tian, Dan, Xu, and Wu. Tian meant self-mockery; Dan meant high confidence to the point of conceit; Xu was a generous and tolerant heart; and Wu was a contented spirit. Wang relied on his personal philosophy when faced with pressures and challenges in his personal and professional life.

**Jason Wang’s “Brothers”**

To run M&N, Wang relied on six members of a diverse team, with each member bringing a different background, education level, and professional skills. Wang felt a strong responsibility for his “brothers, for their careers, and even for their families. M&N’s team included the following six brothers:” Wei Zhang, Hong Sun, Tianfu Wang, Hao Yu, Yue Wu, and Jian Li.

Zhang, M&N’s vice-president for administration and in charge of the digital intermediate technical services team, graduated from Tianjin University, specializing in mathematics and applied mathematics. Zhang had 10 years of R&D experience in visual effects and was a key instructor for M&N’s training and certification programs for Foundry.

Sun was M&N’s new media department director in charge of graphic design and film restoration projects. Sun studied oil painting at the Tianjin Academy of Fine Arts; had more than a decade of experience using Autodesk’s 3ds Max modelling, animation, and rendering software system; and was a top-level engineer for China’s UHD film restoration projects.

Wang was director of M&N’s VFX and video post-production team. At university, Wang studied digital media arts at the Tianjin Academy of Fine Arts.

As head of M&N’s animation department, Yu was also in charge developing the company’s 3-D animation technology. Yu had more than 10 years’ experience in 3-D animation and graduated with a degree in Computer Science from the Tianjin University of Technology.

Wu majored in Computer Science and Technology at Tianjin Polytechnic University. He was the director of M&N’s R&D department and in charge of developing an image-rendering and -processing application for the Android operating system.

Li specialized in mathematics and applied mathematics at Tianjin University and was the company’s Softimage XSI and ZBrush expert. He was M&N’s director of fixed assets management, which included supervision of the company’s computing, storage, and software systems.

**Key Advisors**

In addition to his six employees, Wang also counted on the expertise of two outside advisors, Alex Liao and Marc Su. Liao and Su advised Wang on different areas of M&N’s international business—Su advised on M&N’s business in New Zealand, Australia, and North America, while Liao focused on the company’s interests in Japan, Korea, and Southeast Asia.

Liao, chief executive officer of Cirqin Inc., was the director of the China Animation Game Development Association. Liao completed a degree in Economics at the University of Toronto and a second degree in Digital Animation at Centennial College in Toronto. He worked in the animation industry for more than 15 years and had been a Softimage manager and lead technical advisor in China (both in mainland China and in Taiwan). Through his association, Liao had set up a co-operative network of animation companies, including Ubisoft, Shengda, CCTV, Toei Animation, Infinity Framework, and ImageInfinity.

Su, the founder and director of the Trading and Distribution Company, earned a degree in Computer Science at the University of Western Ontario and a graduate certification in Intellectual Property Law at the National University of Singapore. He had been Autodesk’s Asia Pacific business lead for middleware and game technologies and had more than 20 years’ relevant experience with deep involvement in India, Japan, Korea, China, and Southeast Asia.

Together, Liao and Su helped Wang establish good relations with overseas partners and customers. Wang considered trust to be the most important element in business. Within China, M&N had access to many projects, partly through its support from the Chinese government; however, to access projects outside of China, M&N needed the help of its two advisors to help establish credibility. As Wang explained:

Both Alex and Marc have rich experience and wide channels; they can use their insights and international perspective to assist me. They understand the local culture of the targeted market, and understanding the local culture is extremely important to promoting any product. Only when you understand the culture of the target market can you promote and build trust successfully.

**M&N’S OPERATIONS**

Since its founding, M&N had grown into a mid-sized company with a promising R&D capability. In 2015, M&N received the backing of China’s Ministry of Commerce as an “exporter of Chinese cultural products and services.” M&N featured a flat organizational structure handling the company’s film restoration, post-production, 2-D and 3-D animation and visual effects, R&D, and online education and training (see Exhibit 2). The long-term plan was for the five main departments of M&N to evolve and grow into five subsidiary companies following a starfish-shaped organizational structure.[[4]](#footnote-4)

**Digital Film Restoration**

A centrepiece of M&N’s business was digital film restoration. M&N divided the digital restoration process into three steps: (1) pre-processing, (2) manual restoration, and (3) quality control (QC).

The first step—pre-processing—was largely automated. Normally, when a movie was transferred from physical film to digital media, the dust and scratches on the images meant that the images needed to be corrected and restored. Removing dust blemishes typically meant repairing one or two pixels in each affected image. For this task, M&N’s technicians typically used automated cleaning tools and processes included in sophisticated off-the-shelf multimedia software.

In the next step, manual restoration repaired any tears or blemishes—such as glue marks or dark spots—that had been missed in the pre-processing phase. And, when the original film was seriously damaged, torn, or deformed, manual restoration could fix or replace individual frames of the film.

The final step—QC—was conducted by an experienced restoration worker who would check the restoration quality and ensure that the outcome met the client’s requirements. QC would also verify that the images had been properly cleaned, colour-corrected, and were free of distortions or other errors. Once the QC was complete, the film and digital soundtrack were then scanned, processed, and transferred to UHD media.

**VFX and Animation**

The digital film restoration process had many elements common to VFX. For example, the digital techniques used to correct an image could also be used to remove wires and background elements from an animated or live-action scene. Thus, VFX services fit well with M&N’s expertise.

Procedurally, the VFX and animation process typically required a mix of artistic and technical skills and techniques. Tasks could include character animation, wire-framing, colouring, background illustration, lighting, and textures (such as animating fur or hair). These tasks could also include rotoscoping and keying—two techniques for inserting visual effects into live-action sequences. Once the individual tasks were completed, a visual compositor—working under the direction of a VFX supervisor—would use powerful software and workstations to assemble or composite the elements into the final imagery.

Given the nature of the work, the VFX process typically required complex technical and artistic collaboration. As Wang explained:

VFX needs two kinds of people—our staff artists and our engineers—to work on the same material together. Artists understand human visual senses very well and it is their job to make the images as realistic as possible. But, they must create these images in a process dependent not on playful imagination but on technology. For example, working with an engineer, an artist can use animated “particles” to simulate fire or smoke. Then, together they can work to make the fire or smoke more realistic or even exaggerated to bring out more visual impact. So, VFX needs a lot of co-operation between different workers to complete the work.

**Training and Certification**

At first, the core of M&N’s training services centred on providing training on Foundry’s digital multimedia systems. As the company grew, M&N was authorized to provide training on a range of other systems, including 3D Max, Autodesk, Adobe, Quantel, and Apple. Wang and his team saw M&N’s MOOCs as a natural extension of the company’s training services, but they also saw a need for validating the skills acquired by their students. Thus, with the support of China’s [Ministry](https://www.baidu.com/s?wd=Ministry&tn=44039180_cpr&fenlei=mv6quAkxTZn0IZRqIHckPjm4nH00T1Y3rAmLuWmdm1bznhDvmH040ZwV5Hcvrjm3rH6sPfKWUMw85HfYnjn4nH6sgvPsT6KdThsqpZwYTjCEQLGCpyw9Uz4Bmy-bIi4WUvYETgN-TLwGUv3En103nWfdnH61) of Culture, M&N developed a professional qualification certification system. Without the system, there was no standard method of verifying an applicant’s level of multimedia expertise—a particularly acute problem when hiring freelancers and others working independently. M&N designed the professional certification system to confirm, and then advance, an individual’s current level of digital multimedia expertise, and to verify the various software platforms the individual was capable of using. The certification program measured and validated digital multimedia artists’ and technicians’ production expertise in such areas as style, textures, speed, topology, colouring, and animation, based on both quantity and quality indicators.

**A NEW OPPORTUNITY FOR M&N**

A principal issue with most of M&N’s projects was the enormous volume of images to be processed or created. An average Hollywood film comprised nearly 150,000 individual frames flashing across screens at a minimum of 24 frames per second. The longer the film, the more images M&N needed to create or process. For this reason, despite powerful software, digital multimedia work remained especially labour-intensive. Indeed, the volume of work posed a dilemma for a small company such as M&N—while it needed a large pool of talent to complete the work, it was too costly to hire as full-time staff all the talent M&N needed for its current or future projects (see Exhibit 3).

Outsourcing the work to freelancers seemed a natural solution to M&N’s dilemma, but this option also posed many challenges. As Wang explained:

The process of film restoration or producing VFX requires different artists or engineers working on different elements, which is similar to the manufacturing of cars; different people work on the engine, the gearbox, the tires, the chassis, and another group, company, or team will assemble all the parts together. That’s why many digital film and VFX companies outsource some labour-intensive work in order to reduce costs, particularly the parts that are relatively easy or have lower requirements for quality. The problem with such outsourcing is that you feel a trade-off between quality and price. Also, most companies who try outsourcing cannot always find the right people to do the job, and those that do, often don’t get a fair price for the work.

Given the issues, Wang thought it imperative that M&N work to develop a cloud-based collaboration platform capable of accessing and training all the talent needed for its projects. Again, Wang explained:

By applying cloud-based technology, we should be able to increase the security of our files and data and easily increase the number of truly capable workers assigned to a project, which gives us a great solution to the personnel problems we face in such a labour-intensive industry. And, because the platform will be able to manage and coordinate all the work, we can stick to a project schedule at a reasonable cost.

**Development of M&N’s Collaboration Platform**

M&N’s 4K collaboration platform would make it possible to divide a large complex animation or film restoration project into smaller tasks and subtasks with different levels of complexity and difficulty. It could then feed these smaller tasks to freelancers who had the requisite level of skill and technical ability. In turn, the freelancers—who would be able to remotely access the platform from anywhere in China—could join the projects they were interested in and receive payment through a safe and reliable transaction system.

As designed, the collaboration platform would handle the entire life cycle of digital animation and film restoration from education and training, skills certification and educational credit, project management and implementation, to payment transactions. In other words, the platform would permeate every phase of the work, enabling better and faster integration of the whole value chain.

The platform was designed with three key features:

First, the system would centralize project management while decentralizing the actual production work. M&N could source a world-class film project from a client, subdivide the overall project into smaller tasks, and match the tasks to freelance artists and technicians who had the required skills and training. In turn, the design of the platform’s collaboration and annotation functions would allow project directors to specify the work, assess its completion, and verify that freelancers had achieved the given tasks and goals. This way, the platform would make it possible to assure the quality of the work completed. The data safety and integrity of the system could also be guaranteed because the artists and technicians would remotely access their assigned work on M&N’s servers, rather than download the data to their personal workstations.

Second, the system would provide training to freelancers involved in a project. Specifically, the platform could provide both online digital multimedia training and one-on-one courses as part of the work on a given project. In this way, a freelancer could acquire training on such systems as 3ds Max, Autodesk, Adobe, and Apple, and receive certification recognized by the Ministry of Culture. While some freelancers might pay for the training, it was possible that such training would be considered part of a freelancer’s compensation for work provided. Thus, integrating a training component into the collaboration platform would free M&N from having to find exactly the right talent for a given task and would enable the company to encourage already talented freelancers to upgrade and advance their skills.

Third, the platform would feature payment transaction processing and work evaluation. The payment system would establish a signed contract between two parties as the demands of a project required. Once the two parties—presumably M&N and a freelancer—agreed on the terms of the work to be completed, the system would ensure payment. To this end, the system could set up a progressive payment schedule based on the tasks and milestone completed, with the payments processed through a third-party bank. Naturally, payment would be authorized when M&N’s team had evaluated a freelancer’s work and agreed that a given task had been completed to satisfaction.

**Competition for M&N’s Collaboration Platform**

As envisioned, M&N’s collaboration platform was the only known or planned system of its kind in China. Naturally, following Internet developments and new enabling government policies, there were competing platforms that M&N and other companies could use to find and hire freelance artists and technicians. However, each competing platform seemed to have key limitations.

One notable competitor was Artella, an influential player in the digital multimedia industry supported by Pixar and DreamWorks Animation. Available worldwide, Artella touted itself as a social cloud-based pipeline for artists of any level to collaboratively create animated films, video games, and virtual reality content. Artella focused its business on experimental animation and non-commercial animation projects, meaning that this platform was more focused on the creative arts than on commercial production. Artella could allow online graphic annotations—a key tool in communicating between director and artist—but the system could not handle full remote collaboration. Instead, the only way for artists to work on Artella was to download the necessary files and data to individual workstations.

Another competitor, VSO China, offered an innovative platform focused on animation design. The construction of the VSO China platform was based on a high-performance cloud infrastructure management system. The platform used an independently developed graphic-rendering and -management software program called Golden Farm, which was a highly regarded tool for animation rendering. However, VSO China mainly relied on Microsoft’s Internet Explorer for its interface, so the platform’s resources and speed were limited by the method of connection.

ZBJ was the largest online service transaction platform in China. This service, a major telework platform in China, was the country’s earliest crowdsourcing platform. ZBJ’s transactions included graphic design, website set-up, Internet marketing, writing and editing, and more. ZBJ used a piecework model for individual projects, whereby people who had projects agreed to a given contract and then separated the work into many small design tasks, which would then be offered for completion via ZBJ’s platform. In this way, the project owners could select the best approach for the given project. In turn, the service providers—whether individuals or companies—could source target customers and projects efficiently, while also having greater choice on their work environment and work hours.

Finally, created in 1999, JOBS was set up with two main objectives: (1) providing better career opportunities for motivated white-collar professionals and (2) providing better staff to corporations. JOBS was China’s first professional human resources (HR) services platform to combine traditional media, Internet media, and advanced information technology with the support an experienced professional consultant team. Further, JOBS provided comprehensive professional HR services, including recruitment, training, evaluation, and HR outsourcing. JOBS operated its services in more than 104 cities in China and Hong Kong. In 2004, JOBS became the first Chinese HR service corporation listed on NASDAQ.

**The Decision**

By early 2017, M&N had completed the platform’s architecture and was ready to launch its 4K Ultra HD Film and Animation Production Crowdsourcing and Collaboration Platform. The first task would be populating the system with a roster of freelance artists and technicians, many of whom M&N had trained over the years through its MOOCs.

Yet, even before the platform was fully up and running, new developments presented Wang and his team with a growth opportunity to use and leverage the collaboration platform. The growth opportunity presented three possible options:

* Option 1: With the Chinese Ministry of Commerce’s support and encouragement, M&N was asked by government officials to allow its competitors—indeed the entire digital multimedia and animation industry in China—to use M&N’s new collaboration platform. As the ministry knew, several promising digital multimedia, VFX, post-production, and animation companies in China had gone bankrupt because of the labour-intensive nature of the work involved.
* Option 2: Another possibility—also a request from the Chinese Ministry of Commerce—was to allow domestic companies in other industrial sectors to use the collaboration platform. Here, ministry officials reasoned that companies in industries that had similar work patterns and a similar use of freelancers—such as software programming and publishing—could benefit from using the collaboration platform architecture.
* Option 3: A final possibility—encouraged by the Chinese Ministry of Culture—was to allow digital multimedia companies outside of China to use the system to access China’s large pool of freelance talent. An immediate challenge to this opportunity was the nature of the transaction payment system; it was unclear whether Chinese banks would, or could, process payments to individual freelancers from overseas companies.

As Wang and his team met, it was clear that they faced some deceptively simple questions: Which option was the best choice to secure M&N’s future? Which option best fit M&N’s past, present, and future? Which option would make the best of use of its resources, key personnel, advisory team, and main services? And, because completing and launching the collaboration platform represented M&N’s current focus, Wang and his team also needed help and advice on how best to implement each of the options. Most of all, Wang and his team had precious little time—just a few weeks—to make their decision. What should they do?

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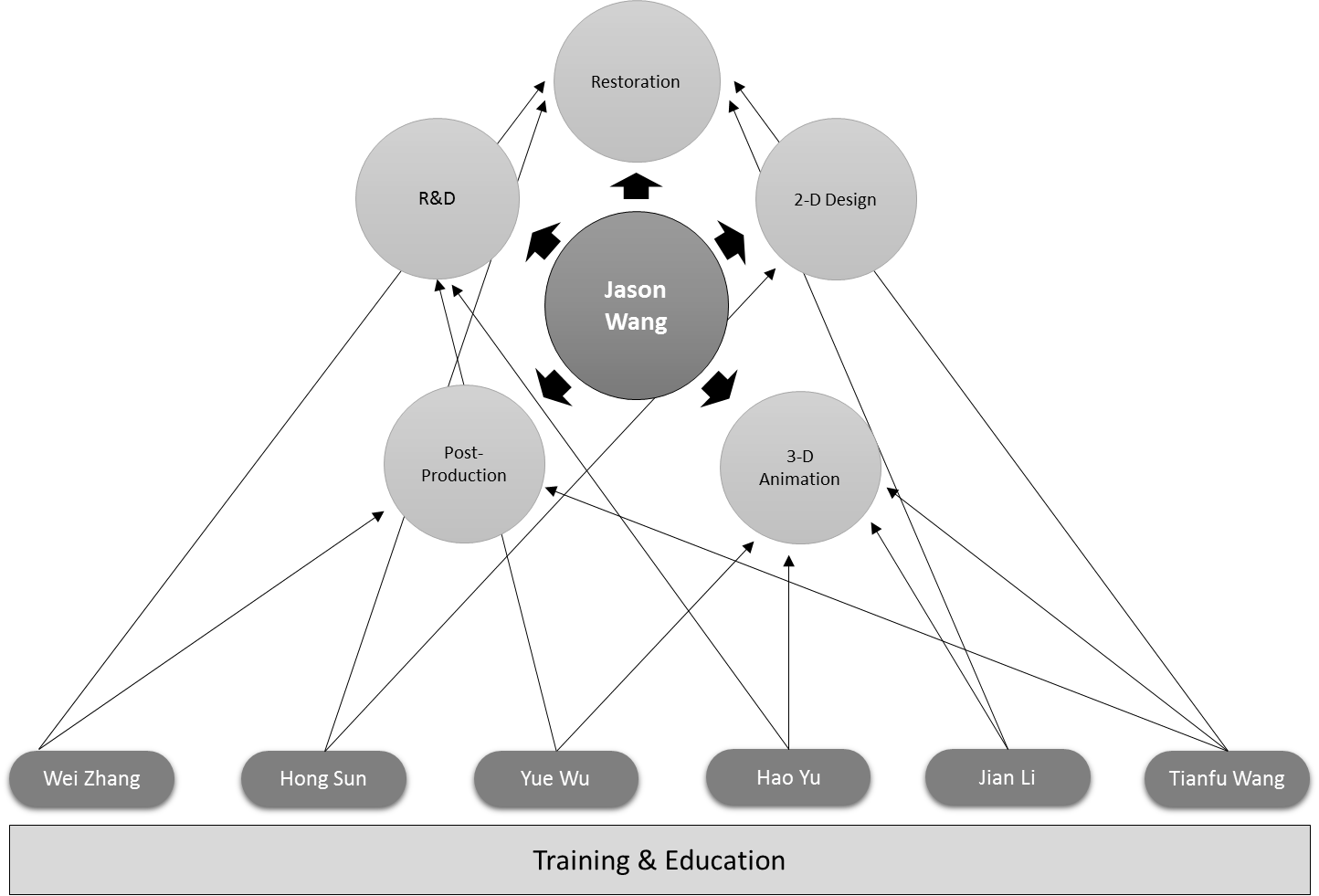
**Exhibit 1: mental and natural’s tIMELINE**

|  |  |  |
| --- | --- | --- |
| 2011 | Foundation and the Prediction of the Future | Main Business |
|  | * Wang and his team foresaw the huge potential domestic and foreign market demand for high-quality 4K UHD pictures. Wang and team co-operated with MTI to work on the 4K film restoration of classic Hollywood movies. * Founded M&N in a 20-square-metre rented house in the Nankai district of Tianjin, China. | * 4K digital film restoration. |
| 2012–14 | Research and Cultivation |  |
|  | * Increased investment in R&D to develop new software and hardware. * Started co-operation with NSCC-TJ to develop 4K UHD remote-access computer service system and data process service system. * Completed design of independent online remote-access production cloud system—The Magnet Cloud. * Became the only education and technical management centre in China authorized by Foundry. * Set up first MOOCs and started collaboration with area universities such as Tianjin University. * Set up the North America R&D Centre in Montreal. | * 4K digital film restoration. * High-end video post-production. * 2-D to 3-D animation and production. * Digital intermediate technical (DIT) services. * Foundry’s online NUKE training and authenticating service. * Online education system training (MOOCs). |
| 2015–16 | Massive Expansion |  |
|  | * Applied for patent and registered trademark for the Magnet Cloud. * Finished design and system construction of the 4K UHD Film and Animation Production Crowdsourcing and Collaboration Platform. | * 4K digital film restoration. * High-end video post-production. * 2-D to 3-D animation and production. * Digital intermediate technical (DIT) services. * Foundry’s online NUKE training and authenticating service. * Online education system training (MOOCs). * Overseas television show production. |

Note: UHD = ultra-high-definition; MTI = MTI Film, a leading digital film restoration company; M&N = Mental and Natural; R&D = research and development; NSCC-TJ = National Supercomputer Center in Tianjin; Foundry = The Foundry Visionmongers, Ltd., a global digital multimedia technology company; MOOCs = massive open online courses

Source: Company files.

**Exhibit 2: mental and natural’s ORGANIZATIONal structure**



Note: R&D = research and development

Source: Company files.

**Exhibit 3: Mental and Natural’s ProfIt and Loss statements, 2013–2015 (in ¥)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **2013** | **2014** | **2015** |
| REVENUES |  |  |  |
| Sales: restoration, VFX, animation, and related services | 3,534,149 | 2,558,453 | 6,169,209 |
| Sales: software, hardware, and related products | 3,054,752 | 3,696,919 | 4,081,419 |
| Non-Operating Revenue | 40,000 | 935,998 | 560 |
| TOTAL REVENUE | 6,628,901 | 7,191,370 | 10,251,188 |
| Operating COGS | 2,345,217 | 3,043,086 | 5,111,847 |
| Non-Operating COGS | 0 | 0 | 0 |
| TOTAL COGS | 2,345,217 | 3,043,086 | 5,111,847 |
| Profit | 4,283,684 | 4,148,284 | 5,139,341 |
| Profit Rate | 64.62% | 57.68% | 50.13% |
|  | | | |
| EXPENSES |  |  |  |
| Payroll | 2,309,010 | 1,496,680 | 1,723,213 |
| Business Travel | 22,281 | 225,445 | 40,760 |
| Sales Expenses | 149,600 | 0 | 0 |
| Accounting | 14,457 | 1,193 | 43,372 |
| Taxes | 86,530 | 82,214 | 113,190 |
| Insurance | 345,710 | 356,420 | 383,655 |
| Rent | 1,255 | 9,650 | 0 |
| Other General and Administrative Expenses | 429,689 | 734,448 | 908,820 |
| TOTAL OPERATING EXPENSES | 3,358,530 | 2,906,050 | 3,213,009 |
|  |  |  |  |
| NET PROFIT | 925,154 | 1,242,234 | 1,926,332 |
| NET PROFIT/REVENUE | 13.96% | 17.27% | 18.79% |

Note: ¥1 = US$0.154 on December 30, 2015; VFX = visual effects; COGS = cost of goods sold

Source: Company files.

1. In industry terminology, full high-definition (HD) digital imagery meant 1080p resolutions, defined by images 1,920 pixels wide by 1,080 pixels high. By comparison, the newer 4K ultra-high-definition (UHD) standard referred to images comprising 4,096 pixels wide by 2,160 pixels high. As a result, UHD was also sometimes called 2160p. [↑](#footnote-ref-1)
2. “Cartoon Rendering,” National Supercomputer Center in Tianjin, accessed December 15, 2015, www.nscc-tj.gov.cn/en/example/example\_10.asp. [↑](#footnote-ref-2)
3. Anthony Rossano, *Inside Softimage 3D* (San Francisco, CA: New Riders, 1998). [↑](#footnote-ref-3)
4. Ori Brafman and Rod A. Beckstrom, *The Starfish and the Spider* (New York,NY: Penguin Books, 2006). [↑](#footnote-ref-4)