CREATIVE TECHNOLOGY LIMITED AND LAWSUITS

BY: FOO SAY WEI
Creative Technology Limited (Creative) is a living legend in the global electronic industry with many subsidiaries around the world. It is actively engaged in research and development (R&D) especially in information technology (IT) and developed several breakthrough products. Creative has over the years, protected its intellectual properties diligently and has been involved in numerous lawsuits. In addition to showing its determination in defending its intellectual properties, these lawsuits have protected its market share of sound cards, gained compensation for its loss of sales in MP3 Players and recouped some of its R&D expenses on Zii processors. However, Creative’s revenue had declined through the years from the peak of USD 1.2 billion in the year 2001 to USD 100 million in 2015, a drop of more than ten folds. Using lawsuits to protect its intellectual properties is proving to be ineffective.

Creative’s Background

Creative is listed on the main board of the Singapore Stock Exchange. Its list of subsidiaries includes Broadxent, ZiiLABS, E-mu Systems, Ensoniq (merged), Cambridge SoundWorks, Data Stream KK and Creative Labs in over eighty countries.

Creative is the worldwide leader in IT products. The company and its subsidiaries are engaged in the research, development, design, manufacture and distribution of digitized sound and video boards, multimedia devices and personal digital entertainment products.

The company has its headquarters in Singapore. Several Creative Labs were set up to carry out sales and distribution activities in more than 80 countries in North America, Europe and Asia. In its golden days, its revenue was over USD 1.2 billion. In fiscal year 2015, it incurred a loss of USD 33 million out of a revenue of around USD 100 million. Close to 50 percent of the sales were generated in the United States (US) and elsewhere in the Americas, approximately 32 percent of the sales in Europe, and the rest in Asia.

The Progress of Creative

Creative was founded on 1 July 1981 by Sim Wong Hoo and Ng Kai Wa. They were classmates in Ngee Ann Technical College, Singapore and both graduated with a diploma in electrical and electronics engineering. The initial investment was SGD 6,000. At that time, Apple II personal computer, introduced in April 1977, was a hot product in the market, so the company seized the opportunity to provide computer repair and training services. With their experience in personal computer, they proceeded to develop and produce their own personal computers, the Cubic 99 in 1984 and the Cubic NT in 1986, the latter being able to play synthesized music and ‘to speak Mandarin’.

IBM Personal Computers were debuted in 1981 and new models with more advanced features were rapidly introduced in succession. Apple Computer Inc. also launched its more advanced personal computer, the Macintosh in 1984. Cubic computers were not able to compete with personal computers produced by the giants and sales were poor. However, the success in creating the products, especially the audio interface gave the founders a boost in confidence in producing the standalone sound card.
Sound cards

In 1986, Chay Kwong Soon, who with marketing experience, was invited to join Creative. They brainstormed and decided that they could not beat the giants in personal computers, but they could cut a niche in the add-on sound card market and US should be their main market. They wasted no time in the product development and in 1987, released a 12-voice sound generator sound card, called Creative Music System (C/MS) for the IBM compatible personal computers using two Philips SAA1099 chips. Sim Wong Hoo personally travelled from Singapore to Silicon Valley and engaged RadioShack's Tandy division to market the C/MS as Game Blaster. At that time, AdLib had a better sound card with Yamaha YM3812 music synthesizer. Creative decided to do better by adding in the feature to record and playback digital samples in addition to incorporating the same Yamaha music synthesizer.

In 1988, the company decided to distribute its own products in USA and established the subsidiary Creative Labs in California. The founders also decided to partner with Microsoft and integrated their sound cards with Microsoft operating system. This move perhaps provided the strongest selling point of their sound cards. In 1989, Creative released the Sound Blaster 1.0 sound card at the Comdex show. The card had full compatibility with the then market leader AdLib's sound card and with added features. It was an instant success and orders keep pouring in as the sound card enabled personal computers to play music and generate realistic sounds for computer games. Creative shares listed in US Nasdaq skyrocketed and Sim Wong Hoo shares were then worth about USD 500 million. Despite being the first in the market in sound card, AdLib did not take appropriate measures to promote its sound cards and protect its intellectual properties. Eventually it lost its competitive advantages and went into bankruptcy. The lesson of AdLib had taught Creative to jealously guard its intellectual property rights and take aggressive measures to prevent competing products to share the market. These are described in detail in the subsequent paragraphs.

Sound Blaster was a de facto standard for sound cards in personal computers for many years bringing in good profits for Creative. With increasing advance in semiconductor technology, the basic functions of sound card were integrated directly onto the motherboard. However, Creative kept on developing sound cards with more sophistication. Monaural Sound Blaster cards were introduced in 1989, and stereo cards (Sound Blaster Pro) followed in 1992. Wavetable MIDI was added with the 16-bit Sound Blaster AWE32 and AWE64 (1996) with 32 and 64 voices; they were classified as fourth generation sound cards. Sound Blaster Live! and the Sound Blaster Audigy (2001) were the fifth generation of sound cards with PCI (PCI is the acronym of Peripheral Component Interconnect and is a part of the Local Bus standard for attaching hardware devices in a computer), multichannel and F/X capabilities. Sound Blaster Z series of sound cards with Sound Core3D processor was announced in 2012. It was categorised as Creative's sixth generation of sound cards. In 2015, the new sound cards included Sound Blaster X7, Sound Blaster E-series and the Sound Blaster X Professional Gaming Series.

MP3 Players

After SoundBlaster, the next innovative product of Creative was the MP3 player. Creative spotted the MP3 audio compression technology which was able to compress digital music by a factor of 11 thus enabling the storage of 11 times more songs in the same memory storage space. In April 1999,
the firm launched the NOMAD line of digital audio players which encompassed the MP3 compression algorithm with hard disk storage. Later, Creative produced the MuVo and ZEN series of portable media players using solid state memory. In November 2004, the company launched a USD 100 million marketing campaign to promote their digital audio products, including the ZEN range of MP3 players.

However, Creative was not able to compete with the follower product, the iPod, produced by Apple Corporation. Some possible reasons are – iPod has more user-friendly design, and users of iPod have the convenience of downloading MP3 compressed music directly from Apple's iTune website. Whereas for Creative’s players, prior to the advent of iTune, users had to buy the music CDs, compress the music into MP3 format and upload into the MP3 players.

ZiiLABS and Zii Processor
At Consumer Electronics Show CES 2009, Creative announced its latest development, the advanced "stemcell like" processor, the ZMS-05 processor from ZiiLABS. It claimed that the processor was energy efficient, small in size, scalable and able to give a 100-fold more processing power than a supercomputer of the same size. In addition, it incorporated advanced consumer 3D graphics.

ZiiLABS was originally founded in 1994 as 3Dlabs and became a wholly-owned subsidiary of Creative Ltd in 2002. In January 2009, the company was rebranded as ZiiLABS. This rebranding was made to reflect 3Dlabs’s change of focus to supply low-power, media-rich application processors, hardware platforms and middleware, rather than just 3D GPUs (Graphical Processing Units).

The latest ZiiLABS processors featuring Stemcell Computing include – 1) ZMS-40 Quad 1.5 GHz ARM Cortex A9 + 96 Core Stemcell Array, 2) ZMS-20 : Dual 1.5 GHz ARM Cortex A9 + 48 Core Stemcell Array and 3) ZMS-08 : 1GHz ARM Cortex A8 + Stemcell Array.

Lawsuits filed by Creative
In the following paragraphs, we shall examine the various lawsuits involving Creative’s products and intellectual properties.

Lawsuits involving Sound cards
1. Creative versus Aztech Systems Pte. Ltd. (Aztech)
When a product became lucrative, imitators and followers surfaced. Aztech, another company in Singapore specialised in IT products, also started making sound cards in Singapore.

Version 1 of Creative’s Sound Blaster sound cards was matched by Aztech’s Version 1 Sound Galaxy sound cards that was marketed in March 1992. Creative launched the second version of sound cards in March 1992. Aztech released their second version in August 1992. Three months later, in November 1992, Creative filed a lawsuit against Aztech in Singapore. Aztech has its headquarter in Singapore and distributed its sound cards in the US under the
brand name "Sound Galaxy" through its subsidiary in California, the Aztech Labs, Inc. Creative, which holds 12 registered US copyrights in its Sound Blaster series, alleged that Aztech infringed its copyrighted materials in its Galaxy series of sound cards.

Creative alleged that Aztech might have disassembled its firmware program and decoded its TEST-SBC program in order to develop the compatible sound cards. In broad terms Creative’s claim was grounded on three central allegations, viz – (a) that Aztech reverse engineered (through disassembly) version 1 of the Sound Blaster firmware; (b) that Aztech copied portions of version 2 of the Sound Blaster firmware, particularly in four undocumented commands, E2, F0, F4 and F8; and (c) by loading TEST.SBC into the PC’s RAM and disassembling it, by means of running the DEBUG program, Aztech infringed Creative’s copyright in TEST.SBC.

Aztech denied disassembling the firmware but admitted running TEST-SBC with the decompiler DEBUG. Aztech argued that such copying of the TEST.SBC program was a fair for the purpose of research or private study under section 35(1) of the Singapore Copyright Act (Cap 63, 1988 Ed) (SCA). Furthermore, it argued that being the lawful owners of TEST.SBC they had the implied license as purchaser to use it for any reasonable purpose, including the purpose of investigating how it interacted with the Sound Blaster card, relying principally on the 1871 decision of Betts v. Willmott. The lawsuit resulted in a settlement agreement on 7 December 1992.

Following the repudiation of this agreement, Creative filed suit in the US District Court for the Northern District of California, claiming that Aztech’s reproduction, adaptation, and distribution of “Sound Blaster clones” in the US violated Creative's exclusive rights under 17 United States Code (U.S.C.). The copyright in question was a US copyright (the works were first published in the US so it was eligible for protection as a "section 101 Berne Convention work" under option (2) as well as eligible under 104(b)(2), and the copyright was registered in the US Copyright Office). The allegedly infringing acts, that was, sale of sound cards, were performed in the US though both are Singapore companies and the products were made in Singapore.

Defendant Aztech moved to dismiss the action on the basis of forum non conveniens. On 24 July, 1995, the district court granted the motion on the ground that the High Court of Singapore was an adequate alternative forum in which to adjudicate Creative’s US copyright infringement claim.

Creative then made an appeal with the Singapore court, citing further evidence of infringement. After a lengthy trial, on 12 November 1996, the High Court of Singapore allowed the appeal. Aztech was to take up a licensing agreement to produce sound cards compatible with SoundBlaster.

1 Forum non conveniens is a discretionary power that allows courts to dismiss a case where another court, or forum, is much better suited to hear the case. This dismissal does not prevent a plaintiff from refiling his or her case in the more appropriate forum.
This was the first attempt by Creative to protect its intellectual properties on sound cards and preserve its position as the sole producer of de facto standard sound cards. Although the purpose of the lawsuit was to defend intellectual properties, the success in this lawsuit also has deterred potential new entrants of sound cards.

2. Creative versus Cyrix Corporation

The MediaGX CPU, a low cost x86 compatible processor manufactured and designed by Cyrix, was introduced in early 1997. The core is based on the integration of the Cyrix Cx5x86 CPU core with hardware to process video and audio output. By integrating functions that previously were carried out by several different processors, Cyrix kept its costs down. Its chips were used in less than USD1,000 computers by Compaq and Packard Bell.

Cyrix claimed that MediaGX was able to produce sound without the assistance of a sound card and that it was compatible with Sound Blaster.

On 17 March 1997, Creative and its US subsidiary Creative Labs, Inc. (collectively "Creative") filed a lawsuit in the US District Court for the Northern California, against Cyrix Corporation and Tiger Direct, Inc. ("Cyrix"). Plaintiff Creative moved for a preliminary injunction against defendant Cyrix for copyright infringement and false advertising. Creative alleged that MediaGX was not compatible with its Sound Blaster and charged Cyrix with false advertisement in violation of the Lanham Act. The suit also alleged that the chipmaker was using Creative’s trademarks and distributing Creative's Sound Blaster audio software driver on its website without permission.

On 7 May 1997, the Court issued a preliminary injunction enjoining further advertisements asserting the "compatible" claim. The court's decision turned on the definition of "compatible." As applied to hardware devices, the Court found that compatible meant that "the first product can be used in place of the second product without producing any difference in performance and that the first product has the same capabilities and functions as the second product." MediaGX was not compatible with Sound Blaster because (1) certain tested software functioned on a computer containing a Sound Blaster sound card but not on a computer equipped with MediaGX and (2) MediaGX could not support a specific function, albeit an allegedly out of vogue function, supported by Sound Blaster.

The court also enjoined Cyrix from continuing to distribute software created by Creative which Cyrix had copied and posted on a website, where it encouraged and provided the means for third parties to copy it. The court found that such conduct constituted copyright infringement.

"We are very pleased to conclude this lawsuit with a clear victory— a permanent injunction that achieves all of our objectives," said John Danforth, vice president and general counsel of Creative Labs, after the announcement of the rulings. The important outcomes of the settlement were that a permanent injunction was imposed prohibiting Cyrix from using or distributing Creative's Sound Blaster drivers and prohibiting Cyrix from displaying Sound
Blaster trademarks or claiming its XpressAudio feature was Sound Blaster compatible unless it supported all Sound Blaster software.

3. **Creative versus Diamond Multimedia Systems and ESS Technology Inc.**
   With good profits made over the years, Creative looked towards acquisition to expand its core business in audio technology. In 1993, it acquired E-mu systems. E-mu Systems was a software synthesizer, audio interface, MIDI interface, and MIDI keyboard manufacturer.


   Creative announced in September 1998 that it had settled its suit with ESS Technology Inc. As a result, ESS Technology stopped production of the Maestro-II chip. The Diamond's S70 Sonic Impact PC audio add-in card, which used ESS' Maestro-II chip had also been discontinued and was then not available, according to information posted on Diamond's web site.

   The patent was granted on 16 December 1997 and Creative took action to file lawsuit in March 1998. It again shows the speed with which Creative took action to defend its hard-earned intellectual property rights.

4. **Aureal Semiconductor versus Creative**
   When a product is lucrative, competitors tried to outsmart the incumbent producer. In 1997, Aureal Semiconductor, a young startup, entered the sound card market with the PCI AU8820 Vortex 3D sound technology. In order to quickly come out with a product that adopts the PCI standard, Creative acquired Ensoniq in January 1998 for USD 77 million. Creative eventually produced the first sound card, named Sound Blaster Live! developed for the PCI bus in August 1998 to compete with upcoming Aureal AU8830 Vortex2 sound chip.

   Before it produced its PCI standard sound card to compete with Aureal, on 5 March 1998, Creative filed a lawsuit against Aureal on infringement of patents of a midi caching technology held by its subsidiary E-mu Systems. Creative claimed that Aureal's Vortex PC audio chips illegally infringed upon patents Creative held on chips mounted on the Sound Blaster add-on card family. Aureal filed a counterclaim stating Creative was intentionally interfering with its business prospects, defaming and commercially disparaging them in unfair competition with intent to slow down Aureal's sales and acted fraudulently. Aureal said that it had reviewed both its patents and Creative's and asserted that the original action
was without merit. Further, Aureal claimed that the purpose of the Creative’s lawsuit was to slow down its sales. The suit came days after Aureal had won business with its AU8820 chip, the company said. According to Kip Kokinakis, President and CEO of Aureal, “We would rather fight Creative in the marketplace, but they have chosen this venue to attempt to distract us from our progress in the market”.

In August 1998, when Creative launched its Sound Blaster Live!, Aureal made a mistake in producing fliers comparing their new AU8830 chips to the then shipping Sound Blaster Live!. The specifications within these fliers comparing the AU8830 to the Sound Blaster Live! EMU10K1 chip resulted in the lawsuit filed by Creative.

The lawsuit related to a series of misleading statements made by Aureal concerning Creative's Sound Blaster Live! product and related technology. Creative Labs alleged that Aureal used those statements to illegally persuade customers to choose Aureal’s products over those manufactured by Creative. The lawsuit, which sought injunctive relief and damages, was filed on September 30, 1998. The lawsuit was separate from — but involved some of the same products as — a patent case filed by Creative against Aureal the year before. That patent case against Aureal was then still pending.

"Creative should not be required to police Aureal or its public statements to ensure their honesty," said John Danforth, vice president and general counsel at Creative Labs. "However, with its series of objective misstatements about Creative's shipping products, Aureal has simply gone too far."

In December 1999 after numerous lawsuits, Aureal won a favorable ruling but went bankrupt as a result of legal costs and their investors pulling out. Their assets were fully acquired by Creative through the bankruptcy court in September 2000 for USD 32 million. Creative then had in effect taken over a major direct competitor in the 3D gaming audio market, except Sensaura which Creative also acquired in December 2003.

This lawsuit illustrates Creative's relentless efforts to engage in battle involving intellectual property. Although Aureal was first in producing sound card with the PCI standard and even won the lawsuit, it went bankrupt because of the heavy expenses involved in litigation. It illustrates how battles can be won against small producers.

**Lawsuit on iPod**
On 5 January 2001, Creative applied for a patent for browsing hierarchical listings of music files in MP3 players. The US Patent 6,928,433 (ZEN Patent) was awarded on 9 August 2005, just barely nicking out similar patents filed for Apple's then-nascent iPod.

The ZEN Patent was awarded to Creative for the invention of user interface for portable media players. Such players included devices like the iPod or cell phones that have the ability to play music. This user interface enabled selection of at least one track in a portable media player as a user sequentially navigated through a hierarchy using three or more successive screens on the display of
the player. One example is the sequence of screens that can display artists, then albums, and then tracks or songs. When the user selects an artist, the player will display a list of albums of that artist. Selection of one of the listed albums then displays a list of tracks on the album. A pictorial illustration of the hierarchical search is presented in Figure 1.

In 2006, iPod was taking increasingly larger share of the MP3 players market. Creative was losing out in its MP3 players. Upon being awarded the patent, Creative immediately attempted to leverage the patent, filing suit against Apple for infringement. Creative asserted that its ZEN Patent covered the user interface in Creative’s NOMAD and ZEN portable digital media players and the iPod, iPod nano and iPod mini. It alleged violations of section 337 of the Tariff Act of 1930 in the importation into the US, the sale for importation, and the sale within the US after importation of certain portable digital media players that infringed Creative’s ZEN Patent. Creative requested that the International Trade Commission issue a permanent exclusion order and permanent cease and desist order.

Apple responded by counter-suing. Apple claimed that Creative Labs infringed four patents in its hand-held digital players. The suit was filed in a Wisconsin District Court on May 15, the same day Creative filed a lawsuit and a trade complaint against Apple. On June 6, Apple filed a second copyright lawsuit and a trade complaint in the US against Creative, claiming Creative infringed three patents relating to using icons, and displaying and editing data. Steve Jobs and Apple Company were asking for cash damages and a court order to stop Creative from further breaches. At the same time, Apple asked the International Trade Commission in Washington to block imports of Creative’s music players.
It was an all-out patent war, which was eventually settled to Apple's clear advantage – Apple agreed to break off USD 100 million in licensing fees to ZiiLABS for rights to the disputed patent. USD 100 million is a pittance compared to its USD 1.5 billion in iPod revenues that quarter. Creative did not get the international injunction on iPod imports it wanted, but USD 100 million was an USD 0.85 per share boost for their quarterly profits. Apple decided to settle the dispute expeditiously as any stoppage of sales of iPod would cost the company more than USD 100 million.

As part of the agreement, Creative would also enter Apple's program as an authorised seller of iPod accessories. Creative would be able to affix the "Made for iPod" logo to its speakers, headphones and other related products.

Michael Kroll, a Syosset, N.Y.-based patent attorney and engineer, called the one-time payment "nickels and dimes" for Apple having a market capitalization of USD 57.4 billion. "A settlement doesn't mean anyone's right or wrong. In general, it's just the cheapest way to get on with life," Kroll said. "You do what's best at the time. I'm sure that's what Apple was thinking".

"Creative is very fortunate to have been granted this early patent," Apple CEO Steve Jobs said in a press release. "This settlement resolves all of our differences with Creative, including the five lawsuits currently pending between the companies, and removes the uncertainty and distraction of prolonged litigation".

In the same release Sim Wong Hoo, chairman and CEO of Creative said, "We're very pleased to have reached an amicable settlement with Apple and to have opened up significant new opportunities for Creative. Apple has built a huge ecosystem for its iPod and with our upcoming participation in the Made for iPod programme, we are very excited about this new market opportunity for our speaker systems, our just-introduced line of earphones and headphones, and our future family of X-Fi audio enhancement products. We expect that the one-time licensing payment of USD 100 million will contribute approximately USD 0.85 of earnings per share to our current quarter, ending September 30, 2006".

This case illustrates the power of injunction. Court battle took a long time and any injunction on sale of products could cost even more than the costs of settlement. For Creative, although it lost market share to the superior Apple iPod, it was compensated though one may dispute on the quantum of compensation. The case also illustrates that the hierarchical search method, a seemingly simple technology, can be patented and used in the lawsuit.

**Lawsuits Against Samsung and Apple**

On 11 March 2014, Creative’s subsidiary ZiiLABS Inc., Ltd. announced that it filed a patent infringement lawsuit in the US against Samsung and Apple. The lawsuit alleged that certain products of Samsung (including various Galaxy phones and tablets, and laptops) and Apple (including various ranges of the iPhone and iPad, iMac and MacBook Pro) infringed on a number of ZiiLABS patents.

ZiiLABS owned over 100 US patents in the graphics, processor and 3D spaces. Ten of these patents were asserted in the lawsuit, in which ZiiLABS was claiming past and future damages for patent infringement, and injunctions against Samsung and Apple. The lawsuit was filed on 10 March 2014 in the Eastern District of Texas. The patents being asserted were:
S/N 88-16-006

Creative Technology Limited and Lawsuits

ZiiLABS alleged that Apple and Samsung made use of the technologies incorporated in these patents for their electronic devices including tablets and smart phones.

One and a half years later, on 30 Oct 2015 Creative announced that its wholly-owned subsidiary, ZiiLABS Inc., had entered into an agreement with Apple to settle the patent infringement lawsuit filed in the US against Apple in March 2014. As part of the agreement, Apple would take a license for the ZiiLABS' patents. Creative said the license payment would contribute approximately USD 0.23 of earnings per share to its the quarter ending Dec 2015.

At this juncture, the case against Samsung is still pending. This lawsuit shows that although Creative did not produce the devices in question, it was able to file lawsuits against others who made the devices.

Business Issues

Creative is noted for its lifestyle digital entertainment products. Its founder Sim Wong Hoo has been named business hero in Singapore for consecutive years. Creative started from virtually nothing and made a huge fortune from phenomenally successful Sound Blaster sound cards that was the de-facto standard for PC audio in 1989. To ensure its dominance in the sound card market, it has spared no effort in protecting its intellectual property rights on the sound card and the trademark Blaster. With its financial muscle, it also has acquired several companies that developed related products.

When the sound card market waned, Creative made inroads into the MP3 player, another revolutionary product. Unfortunately, before it could capitalise on this new innovation, Apple Corporation made a similar product with added features and captured the major market share. Although Creative got a substantial compensation from Apple for infringement of its intellectual property, it could have made more if Creative had the market to itself. This shows the market power of large corporations. MP3 players, however, were rapidly replaced by mobile phones, which are capable of doing almost anything that a dedicated electronic device can do.

Mobile phones are now the most lucrative electronic products. While Creative does not produce mobile phones, it holds patents relating to the mobile phone technology and hence it can extract royalties from lucrative companies.
Over the years, Creative has continued to develop new lifestyle digital entertainment products such as more sophisticated sound cards, premium wireless speakers, high performance earphone products and portable media devices. These products and solutions are marketed to consumers and system integrators through its established worldwide distribution network that include traditional marketing channels, original equipment manufacturers (OEMs) and the Internet.

However, these products did not command the kind of sales like its Sound Blaster. Creative’s revenue had declined through the years from the peak of USD 1.2 billion in the year 2001 to USD 100 million in 2015, a drop of more than ten folds.

There are issues with the business. What should Creative have in order to profit from its continual focus on research in technology and protection of intellectual properties? Most of all, what should Creative do before it can apply technologies and develop new products successfully.

**End-of-Case Questions**

**Question 1**
Creative filed lawsuits against several soundcard makers from 1992 to 1998. Discuss the speed of filing the lawsuits by Creative, the nature of the lawsuits, the outcomes, the settlements and the impact of the lawsuits on the sales of Creative Sound Blaster.

**Question 2**
What intellectual properties were involved in the case against iPod? What were the likely reasons that Apple wanted to settle the case before court hearing?

**Question 3**
If Creative is to continue on its focus on research in basic technology, and protect its intellectual properties and profit from them, what core competencies does Creative need to maintain and improve in order to sustain this approach?

**Question 4**
If, in addition, Creative is to apply and incorporate its own technology and its intellectual properties in end-user products such as lifestyle digital and entertainment products and market these products to consumers, what core competencies does Creative need to develop in order to be successful in this approach?
### Appendix A

**Key Dates**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1981</td>
<td>Sim Wong Hoo and Ng Kai Wa founded Creative as a computer repair and training store in Singapore.</td>
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<tr>
<td>1984</td>
<td>Creative released its first company designed personal computer, the Cubic 99.</td>
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<tr>
<td>1986</td>
<td>Creative released the Cubic NT, which featured colour graphics and stereo sound reproduction.</td>
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<tr>
<td>1988</td>
<td>Creative set up the subsidiary Creative Labs in US, and began marketing the Game Blaster sound card.</td>
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<tr>
<td>1989</td>
<td>Creative released the Sound Blaster sound card, which became the de facto sound card.</td>
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<tr>
<td>1992</td>
<td>Creative went public and became the first Singapore company to list on the US NASDAQ stock exchange.</td>
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<td>1993</td>
<td>Creative acquired E-mu Systems, Inc., incorporating its wavetable technology into the sound card line. In the same year, Creative also acquired ShareVision Technology and Digicom Systems to enter the videoconferencing and modem markets.</td>
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<tr>
<td>1993</td>
<td>On 25 October 1993, Creative filed Sound Blaster as a registered trademark and Blaster as a trademark of Creative.</td>
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<tr>
<td>1994</td>
<td>Creative listed its shares in the Singapore stock exchange.</td>
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<tr>
<td>1995</td>
<td>Creative launched its first graphics card product, the 3D Blaster, the first 3D-capable card for PC video games.</td>
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<tr>
<td>1997</td>
<td>Creative acquired Cambridge Soundworks and launched a line of multimedia speaker systems. In the same year, Creative also acquired OPTi Systems Inc.</td>
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<tr>
<td>1998</td>
<td>March 5, 1998, Creative filed a lawsuit against Aureal on infringement of patents of a midi caching technology held by E-mu Systems.</td>
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<td>1998</td>
<td>Creative acquired Silicon Engineering.</td>
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<tr>
<td>1999</td>
<td>Creative became the first company to produce and market personal MP3 players and launched the Nomad line of personal MP3 players.</td>
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<tr>
<td>2001</td>
<td>Creative launched a new generation of sound cards, the Audigy line.</td>
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<td>2002</td>
<td>Creative acquired 3D Labs and re-entered the graphics card market.</td>
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<td>2003</td>
<td>Creative announced a line-up of 20 new Lifestyle Digital Entertainment products.</td>
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<tr>
<td>2005</td>
<td>On 22 March 2005, Creative Labs Inc. settled class action lawsuit by giving customers who are unhappy with their original Audigy or Extigy products a 25 percent discount on the purchase of a new Creative’s product.</td>
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<tr>
<td>2006</td>
<td>In 2006, Creative filed a lawsuit against Apple as its iPod infringed Creative ZEN patent.</td>
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<tr>
<td>2014</td>
<td>11 March 2014 – ZiiLABS Inc., Ltd. announced that it filed a patent infringement lawsuit in the US against Samsung and Apple.</td>
</tr>
<tr>
<td>2015</td>
<td>In October 2015, Apple took up a license for ZiiLABS’s patents.</td>
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Bibliography


About Nanyang Technopreneurship Case Centre

With funding from both the National Research Foundation of Singapore and Nanyang Technological University, the Nanyang Technopreneurship Case Centre (NTCC) was one of the initiatives of the Nanyang Technopreneurship Centre (NTC) to enhance the quality of entrepreneurship education through the case pedagogy. These are part of NTC’s efforts to foster, promote and nurture enterprising mind-sets, skills and knowledge in entrepreneurship education.

There is a plethora of business cases but a general paucity of cases highlighting the specific problems faced by technopreneurs in growing their ventures. NTCC adds value to Technopreneurship education by developing a pool of cases on technology-based local and international enterprises. Through the cases, NTCC hopes to share the experiences, success stories and challenges faced by entrepreneurs/intrapreneurs in growing their organisations and how they overcome their problems to sustain growth.

The theme of this first compendium is “innovation through technology”. It features Singapore-based and global companies confronting issues and challenges due to technological shifts in the industry and changing market and competitive dynamics; when introducing new products in the marketplace; and in using technology to drive organizational change.

Online versions of these cases are available for complimentary downloads at www.ntc.ntu.edu.sg/ntcc.

Teaching notes are also available to faculty members for use as reference, reading and/or teaching materials in various academic and professional programs. For further information, please contact Ms. Denise Lee (deniseleecw@ntu.edu.sg) and Mr. Wu Chong Chuan (wucc@ntu.edu.sg).

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