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Polyphonic HMI: Mixing Music and Math

So few songs actually become hits—Las Vegas gives you better odds than the music industry! You might as well just put a million dollars on red and spin the wheel . . .

—Ric Wake, Independent Music Producer

In late 2003, the management team of Barcelona-based Polyphonic HMI was preparing to launch an artificial intelligence tool that they believed had the potential to create tremendous value for the music industry. The technology, referred to as Hit Song Science (HSS), analyzed the mathematical characteristics of music (by isolating aspects such as melody, tempo, pitch, rhythm, and chord progression) and compared them with characteristics of past music hits, making it possible to determine a song's hit potential. Mike McCready, the CEO of Polyphonic, explained:

> The music industry has always used two criteria to determine if a song will be a success. One is that it sounds like a hit. They have professionals at the music labels who are paid to determine if a song sounds like a hit. And two is that they have an idea how they can bring the artist and the song to the market. The problem is that the industry has about a 10% success rate: only one in 10 songs that get promoted ever charts. We add a third criterion—that it has to have optimal mathematical patterns—and significantly increase success rates.

"This piece of technology is truly special," he raved. "In one of our early tests, HSS generated unusually high scores for Norah Jones, a jazz singer who most industry insiders expected to have limited commercial impact but whose album later rose to the top of the charts. We also correctly predicted each of the hits of rock band Maroon 5."

Nevertheless, Polyphonic was having its share of problems. Initial sales pitches had met with resistance. "When we tell music executives about the concept, they typically look at us with glazed eyes, check their watch, and think of an excuse why they need to leave as soon as possible. Many people simply cannot imagine that science might play a role," said Tracie Reed, Polyphonic's vice president. In addition, the company had to abandon efforts to market a music recommendation system based on the same technology to retailers when hardware partners could not be found. Funds were running very low as a result—McCready himself had agreed to forgo his monthly paychecks in exchange for company stock.

Professors Anita Elberse, Jehoshua Eliashberg (The Wharton School, Philadelphia), and Julian Villaneuva (IESE Business School, Barcelona) prepared this case. HBS cases are developed solely as the basis for class discussion. Some nonpublic data have been disguised and some business details have been simplified to aid classroom discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

At this point, Antonio Trias, the creator of much of the HSS technology, provided Polyphonic with a personal investment of $150,000. Armed with what McCready called a "shoestring budget," the Polyphonic team was faced with several pressing questions. What was the best target market for this piece of technology—record companies, producers, or unsigned artists? And what was a suitable marketing plan? Specifically, how should the product be positioned, priced, and marketed?

Company Background

Polyphonic HMI was a subsidiary of Grupo AIA, a company that used its expertise in the area of artificial intelligence and the natural sciences (such as mathematics and physics) to solve complex business problems. Founded in 1988, AIA was headquartered in Barcelona but also had operations in Mexico and the U.S. It generated just over $5 million in revenues in 2002. Many of the approximately 50 employees, including four of the five top managers, had Ph.Ds in fields such as mathematics, physics, and engineering. "AIA is known for approaching business problems from different scientific perspectives," said Regina Llopis, AIA's CEO. "Our Ph.Ds are often working on one specific business problem, each from a different point of view. Together, they come up with a solution."

AIA operated in a wide range of industry settings, ranging from energy and finance to telecom and e-business. For example, its product portfolio covered a planning and monitoring tool for electric grid network operators, a money-laundering detection system for financial institutions, and a network interconnections management system for telecommunications providers. All products were artificial-intelligence and natural-science applications. Its list of clients was dominated by several of the main Spanish companies in banking (such as Caja Madrid, Grupo Santander, and La Caixa), utilities (such as Red Eléctrica de España, Endesa, and Gas Natural), and telecommunications (like Auna) but also included major players in those sectors in Europe, Latin America, and the U.S.

Polyphonic HMI, founded in 2002, was AIA's first foray into the entertainment sector. As the name implies,[1] Polyphonic was established specifically to market Grupo AIA's artificial-intelligence tools to the music industry. Its top managers, consisting of Jimena Llopis (executive chairman), McCready (chief executive officer), and Reed (vice president for North America) each had a background in music. They had assembled an experienced advisory board, which included Thomas Mottola, one of the music world's most prominent artist managers who previously had served as chairman and CEO of Sony Music Entertainment, and Ric Wake, a leading producer who scored numerous hits with artists such as Taylor Dane, Mariah Carey, and Celine Dion. Brief biographies for the management team and advisory board are provided in **Exhibit 1**.

Polyphonic's management team worked with a small group of dedicated scientists and other staff members and had access to experts in the Grupo AIA parent organization. The annual fixed costs of operating Polyphonic were estimated to be around $500,000.

Basic Technology

The technology underlying HSS found its origins in an extensive analysis of millions of songs. This covered nearly all music released by music labels since the 1950s, and the database was updated weekly with new releases. Polyphonic devised a way to "listen to" a piece of music and isolate

[1] The term "polyphony" refers to "music with two or more independent melodic parts sounded together" (Source: *The American Heritage Dictionary of the English Language*, Fourth Edition, Houghton Mifflin Company). HMI stands for "human media interface."

particular patterns. The process, referred to as "spectral deconvolution," considered over 25 characteristics in total, including melody, harmony, tempo, pitch, octave, beat, rhythm, fullness of sound, noise, brilliance, and chord progression. Based on its mathematical characteristics, each song was then mapped onto a multidimensional grid called the "music universe." **Exhibit 2** provides some details.

Songs with mathematical similarities are positioned very close to one another in this universe. According to McCready, the technology organized music in ways that sometimes seemed counter-intuitive:

> Our technology reflects the mathematical patterns in the music—not necessarily the sound of music. For example, as far as the melody pattern is concerned, one composition by Beethoven could fall on one end, and another composition by Beethoven on the opposite end of the universe. Similarly, one Beethoven composition could fall very close to a song by rock band U2 or pop singer Mariah Carey.

Music Recommendation System

Polyphonic had initially used the technology to develop a music recommendation system. The idea was to develop a device placed in music stores that provided recommendations to shoppers, thereby helping retailers to increase sales. McCready explained:

> Many people walk into music stores looking for something new, but they just don't know how to look for it. We believe people don't just like a certain genre of music but that they like specific mathematical patterns that transverse music genres—genres are just marketing terms. Our recommendation system locked onto that idea: we asked what music a consumer liked, matched that to our universe of music, and used that information to recommend other music.

Polyphonic planned to license the technology to retailers such as Best Buy, HMV, and Virgin Megastores for up to a quarter of a million dollars a year. It had developed the software needed for the system and counted on partners to develop the accompanying hardware. Unfortunately, the difficult economic situation—annual music sales were sharply decreasing—caused reluctance among retailers and hardware providers. "The sales cycles with the hardware providers proved to be extremely long. We are a small, tenuously financed company, and we could not afford to ride this out," said McCready, "so we went back to the drawing board. We knew we had to come up with another application of the technology."

Hit Song Science

That new application became HSS. McCready explained how the idea emerged:

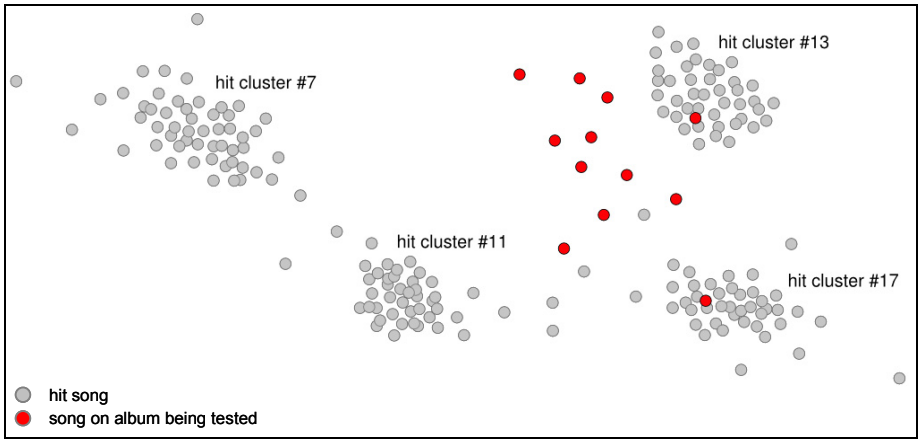
> Antonio Trias, the vice president for innovation at AIA, figured out that hit songs had common mathematical properties. He had gone back to the music universe and had initially focused on songs that had made it to the Singles Top 40 of the leading music chart, the Billboard Hot 100,[2] in the past five years. When he found that there were only about 50 to 60 hit clusters—not an infinitely large number—we realized the potential of the idea.

[2] Each week, the Billboard Hot 100 ranked singles based on sales and radio airplay. The chart was compiled by Nielsen Broadcast Data Systems and Nielsen Soundscan and published in the music trade publication *Billboard Magazine*.

McCready and his team felt the existence of clusters was evidence for the view that hit songs share certain mathematical patterns. Consequently, the extent to which new releases "fit" those clusters should indicate their hit potential (see **Figure A**). McCready said:

> We can take an unreleased album and examine how the songs on that album map onto the clusters. If a song falls *within* one of these clusters, we can't necessarily say that it will be a hit. We just know it has the potential. The song has to conform to a couple of other criteria in order to become a hit: it has to sound like a hit, be promoted like a hit, and be marketable. But if a song falls *outside* of the clusters, we know it will probably not become a hit.

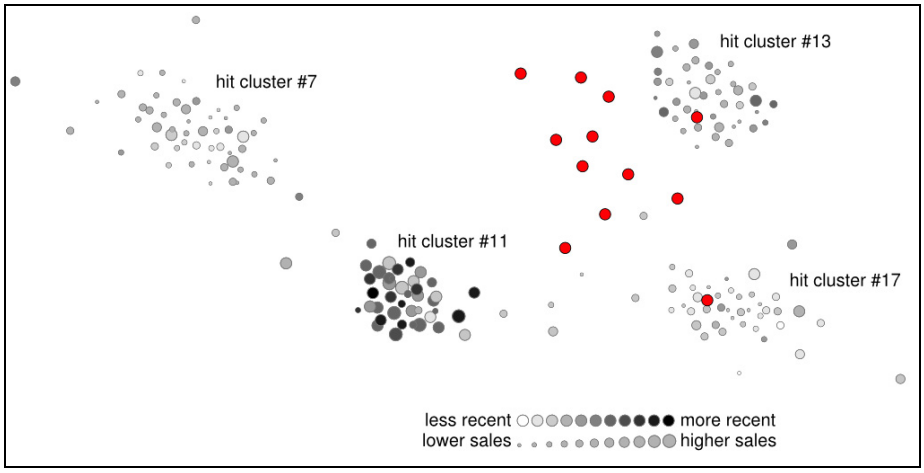
Figure A Hit Song Science: A New Album Mapped onto Hit Clusters



Source: Polyphonic HMI.

The closeness to a cluster was indicated with a "Hit Song Science score" on a scale of 1–10, with higher scores indicating a great hit potential. The clustering technique also allowed Polyphonic to provide insights into the coherence of an album, that is, the extent to which songs fall into the same or nearby clusters, and a list of songs with similar mathematical properties.

Figure B Hit Song Science: A New Album Mapped onto Hit Clusters (with weights)



Source: Polyphonic HMI.

Additional testing led to further refinements. For example, by giving higher weights to songs in the universe with higher sales levels, Polyphonic scientists could better pinpoint the significance of a cluster. Similarly, by focusing on more recent successes among the songs in the universe, they could incorporate the extent to which tastes might change over time (see **Figure B**).

As of late 2003, AIA and Polyphonic had spent about $600,000 developing HSS. Now that the technology was in place, generating reports for clients was relatively inexpensive. McCready estimated it took about two hours, at a total cost of $300, to analyze an album with 10 songs.

The Music Industry[3]

The worldwide market for recorded music was worth over $32 billion at the retail level in 2002 (see **Exhibits 3a** and **3b** for a breakdown of sales by region and country). The number one market, the U.S., was a strong force in the world's music business, both as a place of origination of new music and as a consumer of music products. In 2002, about 30% of all the recorded music was produced there, and the size of the retail market was well over $12 billion, or 39% of worldwide sales (see **Exhibit 4** for manufacturers' shipments). European countries accounted for 34% of worldwide sales in 2002, with the U.K., Germany, France, Italy, and Spain being the largest markets.

Most major regions of the world had endured several consecutive years of falling music sales, which many industry insiders attributed to online and offline piracy. Although legal online downloads were still a small fraction of total sales, the rise of music distribution via the internet was beginning to affect music consumption. **Exhibit 5** provides insights into consumption patterns.

Recording Music

Artists The music recording process typically started with the artists who wrote song lyrics, composed music, and performed music. Recognized talent and some new artists typically had contracts with a "label" within a record company that stipulated the terms under which they were to deliver one or more albums. They were supported by legal advisors, managers, and agents who helped them negotiate contracts, book concerts, and schedule recording sessions, among other things.

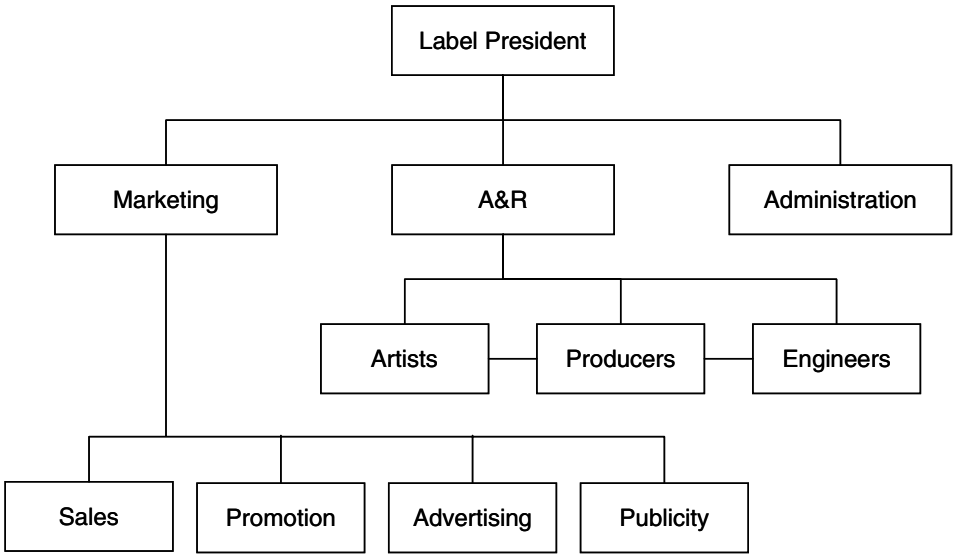
McCready estimated that there were about 10,000 artists with a record contract in the U.S. and Europe, but only several hundred with some name recognition and commercial success. Tens of thousands—if not hundreds of thousands—of artists were hoping to secure such a contract. "Every high school has a band who think they will be the next big thing," said McCready. Unsigned artists often used "demo" (demonstration) recordings to attract a music publisher's interest. "Record companies are always on the lookout for good, new material, and labels may receive three to four hundred demos a week," mentioned McCready, "but only a small fraction of those demos lead to record contracts." When labels signed artists, they usually required an artist to deliver several albums over a certain period and work exclusively for that label during that time.

Record companies There were five big companies, "the majors," that dominated the recorded music business: BMG Entertainment, EMI, Sony Music, Universal Music Group, and Warner Music Group (see **Exhibit 6** for their 2002 market shares). Each of those companies had various labels and music publishing companies under their umbrellas. For example, Universal Music Group incorporated at least a dozen labels aimed at the U.S. market, including Motown, Interscope, Geffen,

[3] This section draws on Harold L. Vogel, *Entertainment Industry Economics* (Cambridge, UK: Cambridge University Press, 2001).

MCA, Universal Classics, Universal Records, Universal South, and Universal/Island, and three times as many labels aimed at international markets. Some labels covered all music types, whereas others specialized in certain music genres. In the U.S. alone, there were also tens of thousands of small and midsized record companies. **Figure C** depicts how labels are commonly organized.

Figure C Typical Organization of a Record Label



Source: Casewriters.

When labels signed an artist, they typically had an in-house producer, known as an artist-and repertoire (A&R) person, guide the project. "A&R executives are usually young people who really like music and who have convinced somebody that they have 'good ears,'" said McCready. Quique Tejada, an A&R director at Spanish record company Vale Music, explained his role: "I prepare the launch of new artists. I look for talent, find songs that they can record, select the best producer for each project, participate in the recording process, and check the master recordings. I am responsible for 20 artists." "An A&R executive is shepherding a band he has discovered through their early career development," added McCready. "He wants to make sure that their music is successful, because his career rides on that success. Most A&R people have a career span of three to four years. Those with a longer career span really become somebody in the music industry—people know who they are."

Nurturing talent was a critical activity for record companies. The lion's share of a record company's revenues was generated through its established artists—not new artists. For Warner Music Group, for example, established artists accounted for almost 90% of the $1.7 billion in revenues from newly released titles in 2003.

Producers In addition, artists often worked with independent producers who, much like the A&R people, helped the artist select music and develop a music style, oversaw recording schedules, recruited engineers, and watched over recording budgets. "A producer can be responsible for a lot of things—writing the song, recording the song, mixing and editing it, making sure it has the right vibe. The producer is the pivot between the label, the publisher, the manager, and the artist," explained

independent producer Wake. "A good producer can see what an artist is supposed to sound like and come up with the right sound, or take an artist who has a vision and help him or her realize it." He added: "I once saw a performance by a girl named Leslie Wonderman and just had a strong feeling, a special sensation, that she could be a star. I turned her into Taylor Dane, found a sound that worked for her, and helped her score several huge hits."

According to Wake, there were only about 20 to 30 top producers who were responsible for the majority of successes, a larger group of a few hundred producers who had a hit once in a while, and thousands of people trying to establish themselves as producers.

Deals among Artists, Producers, and Record Labels

The deals among artists, producers, and labels could be structured in a number of ways. In some cases, the label signed the artist and hired an in-house producer, compensated through salary plus perhaps some royalties, to handle the project. In other cases, the label retained an independent producer or company to deliver a master recording for an artist under contract. In a third variation, independent artists and producers made a master recording and then tried to sell the master to a label.

Income from music came from three different royalty streams. Mechanical royalties were mostly derived from the sale of music recordings. Performance royalties were earned each time music was performed (by radio stations, orchestras, nightclub singers, and so on). Synchronization royalties were paid for music played to visual images and soundtracks.

A record company typically paid an artist recording a new album an up-front fee and, once sales had passed a level that allowed the company to fully recover its costs, also a sales-based payment. The latter depended on the artist's track record and stature but usually varied between 5% and 15% of the record's suggested retail price.

Industry contracts generally dictated that most of the costs of making a record were to be repaid out of the artist's up-front fee and royalties. "A record contract is essentially a loan from the record company to the artist," clarified McCready. Managers and talent agents alone extracted between 25% and 40% of a performer's income. Outside producers usually received a production fee and often also negotiated a royalty of 1% to 5% of the suggested retail price. Production fees varied dramatically, according to Wake: "A Mariah Carey record may be close to a million dollars in production fees, but a first record by a new artist might have only cost $100,000."

Marketing and Distributing Music

The recording process ends with the delivery of a completed master. At this point, record companies start planning a marketing campaign for the album (or individual singles) and establish a timetable for the physical production and distribution of records.

Although practices differed across labels, the record label president and marketing director generally made final decisions about marketing strategies, but the A&R person also often played a role. "Our marketing department develops and executes a marketing plan for each of our artists, but I participate in that process as well," remarked Tejada about the procedure at Vale Music. "In my role as the A&R director, I am most frequently in contact with the artists and know what strategies will work for them. At our weekly marketing meetings, which are led by our president and attended by all 12 of our executives, I often speak out on marketing issues."

One of the most important decisions for a label usually was which single of an album (with on average of 10 songs) to release first. "Virtually all mainstream albums released nowadays are accompanied by a single," said McCready. "Radio airplay is the primary advertising vehicle for popular albums—and you need a single to get on the radio. The same is true for music television, which is also an important advertising channel—you need a strong single to get on MTV."

Particularly for new artists, the first single was often a make-or-break situation. "I have heard of many situations where albums were left to 'die' when the first single underperformed," said McCready. "When that happens, labels commonly decide not to release any more singles by that artist and essentially give up on the advertising campaign. It could be the end of the artist's career."

Marketing music was expensive. "The release of a single usually involves at least $300,000 in marketing expenditures—and that is just what they will spend on the first single for an unknown artist," said McCready. "Labels may spend in excess of $1 million to promote the single of an established star like Mariah Carey." Often, labels did not expect to make that money back on single sales, according to McCready: "The album, not the single, will often deliver the lion's share of revenues." In the U.S., the first single and the album were typically released at the same time.

Marketing campaigns involved anything from the production of music videos to concert tours, cooperative advertising with retailers, in-store merchandising materials, radio and television commercials, and press kits. To promote the song and get it played on the radio, free records were often sent to hundreds of radio stations. Because radio was a significant factor in introducing new artists and songs to consumers and because popular music stations were able to add at most three or four new cuts per week to their lists, competition for airplay was intense. After bribery (so-called payola) of radio stations had been outlawed in the 1960s, record labels had turned to hiring independent promoters to ensure airplay for new songs or paying "advertising" fees for a song's first spins on the radio. Generating significant airplay for a song could easily cost $100,000 in promotion fees alone.

The lion's share of recorded music was distributed in a physical form, on a compact disc. Each year, approximately 30,000 new full (album) CDs were brought to the market. Not all of those albums were aimed at a broad, mainstream audience—McCready estimated that about 2,500 of the albums released each year were accompanied by one or more CD singles. The distribution arms of the five majors accounted for the large majority of shipments of all discs.

The suggested retail price to consumers of a full (album) CD was just under $17 in the U.S.; music retailers paid about $10.50 for a CD. As contractual terms among labels, artists, and other parties often differed substantially, the breakdown of costs for labels could vary widely. Record labels typically sought a margin of at least 30% of the price to retailers, after paying royalties to artists, fees to the publisher (about 5% of the price to retailers), manufacturing and distribution costs (about 10% of the price to retailers), administrative expenses (also about 10% of the price to retailers), A&R expenses (often as much as 15% of the price to retailers), and marketing and promotion costs.

CD singles were typically priced between $3 and $5. Although the large majority of consumers continued to buy music offline and in the form of albums, the rise of online distribution channels also stimulated downloads of individual songs, which were typically priced around a dollar each.

A Hit-and-Miss Business

The vast majority of music released never became a hit. Ken Bunt, an executive at Disney's Hollywood Records, commented on the uncertainty surrounding new releases: "Releases in the

music business traditionally are a big gamble. We can spend millions of dollars to put a product on the market and not be sure whether there will be any demand for it or whether it will get any airplay." For each label, the few successes covered the losses made on the many failed titles. For example, in late 2003, Norah Jones seemed well on her way to single-handedly preventing a market share decline for her label, Blue Note, which was part of EMI.

Exhibit 7a and **Exhibit 7b** list the top-selling albums and singles in the U.S. in 2002. As **Exhibit 7a** shows, the year's 25 highest-ranked albums sold just below 3 million units on average. A total of 65 albums sold over 1 million units in 2002. In that same year, just over 120 albums achieved "Platinum" status, indicating sales of at least 1 million units over their lifetime. In contrast, in that same year, only two singles reached the 1 million sales mark.

It was a well-known industry fact that less than 15% of music titles released were profitable. According to McCready, having a single on the weekly Billboard Singles Top 40 chart was the best, albeit not a perfect, indicator of a label's ability to recover its production and marketing costs. He estimated that fewer than 300, or about 10%, of the approximately 3,000 singles released each year made it to the Billboard Singles Top 40. Similarly, he estimated, only 10% of all 2,500 albums had at least one single that made it to the Singles Top 40. (The difference was caused by albums that had more than one successful single.)

Based on information obtained from an industry expert, McCready had compiled key statistics (see **Table A)** to "guesstimate" the likely revenues in each case:

Table A Estimated Revenues for Singles and Albums with and without a Top 40 Chart Position

Expected Revenues for . . .	Low Estimate	Medium Estimate	High Estimate
A single that does not reach the Singles Top 40	$0	$10,000	$100,000
A single that reaches the Singles Top 40	$100,000	$200,000	$2,000,000
An album with a single that does not reach the Singles Top 40	$0	$90,000	$300,000
An album with a single that reaches the Singles Top 40	$300,000	$2,000,000	$40,000,000

Source: Polyphonic HMI.

"Averages are not very meaningful in the music business," remarked McCready. "You either lose a lot of money with a dud, or you win a lot of money with a hit." He added: "And of course a runaway smash hit can generate significantly more than $40 million in album sales, especially if the song makes it into a movie or advertising campaign. Some albums bring in $90 million in revenues! Unfortunately, such hits don't come around very often."

Most record companies engaged in research activities to help them forecast sales levels for the titles in their portfolios. "Everyone has their own technique," remarked McCready. "One top record-label executive, Antonio 'LA' Reid, likes to round up kids out on the streets in New York and let them listen to new artists and new songs. Clive Davis, another famous executive, prides himself on his 'ears'—unless it sounds like a hit to him, it is not, and he does not want to know what anybody else thinks." "Some labels still work completely on gut instinct," agreed Hollywood Records' Bunt. "But we do not stick our head in the sand. We almost always do some focus group or online testing beforehand and play it for people ahead of the release, asking them if they would want to hear it on their favorite radio station."

So-called call-out research was the most popular research method. Record companies would enlist the help of market research companies, which called respondents at home, walked them through a prescripted screening process and, if the respondents qualified based on demographics, music listening behavior, or other characteristics, submit them to a music test. They played specific "hooks" (15- to 30-second fragments) of songs respondents were asked to rate, for example by using the push buttons on their phone or by directly giving their score to the interviewer. Depending on the number of people surveyed and the method used, "Call-out studies usually cost the record labels between $5,000 and $7,000 per song," according to McCready. "Internet polling starts at around $3,000," he added, "and focus group research can cost record labels as much as $10,000 per song."

"Despite these traditional research techniques and executives' gut instincts," said McCready, "only one out of every 10 songs that gets promoted as a single actually charts. I have spoken with A&R people who pride themselves on a success rate that is 2% or 3% higher than average."

Hit Song Science: Improved Odds?

HSS, McCready argued based on the results of initial tests, could give the industry much better odds. "The analyses we have performed for music released in the U.S. in the past six months suggest that Hit Song Science can achieve a success rate of 80%—we correctly predicted whether a single would reach the Singles Top 40 eight out of 10 times," he said. **Table B** reflects the results of a representative sample.

Table B Hit Song Science's Success Rates: A Sample

Artist	Song Title	HSS Rating > 7.00	Weeks in the Singles Top 40	Highest Chart Position
Outkast	Hey Ya!	Yes	29	1
Clay Aiken	This Is The Night	Yes	6	1
Santana Feat. Alex Band	Why Don't You & I	Yes	28	6
R. Kelly	Step In The Name Of Love	Yes	22	9
Monica	So Gone	No	13	9
t.A.t.U.	All The Things She Said	Yes	26	12
Daniel Bedingfield	If You're Not The One	Yes	15	12
Uncle Kracker Feat. Dobie Gray	Drift Away	Yes	17	13
Brad Paisley	I Wish You'd Stay	No	0	--
Jennifer Hanson	Beautiful Goodbye	No	0	--

Source: Polyphonic HMI.

"If a song scores an HSS rating of 7.00 or higher, we believe it has the potential to become a hit," McCready explained. "It turns out we were correct in nine of these 10 examples. Only 'So Gone,' a song by Monica, just missed our cutoff point. It was released anyway and actually performed quite well." He added: "However, on two other songs with low HSS ratings, 'I Wish You'd Stay,' by Brad Paisley, and 'Beautiful Goodbye,' by Jennifer Hanson, we were right—they were released but never made it to the charts."

As of late 2003, despite an extensive search, the Polyphonic management team was not aware of any comparable products. "It is up to us to show that science—Hit Song Science—can radically

improve the odds of success in the music industry," McCready said, "and if we succeed, we will dramatically alter the business."

Developing a Marketing Strategy for Hit Song Science

Armed with a budget of only $150,000, the management team faced the task of developing a marketing strategy for Polyphonic's breakthrough product. They had to resolve two particularly pressing questions.

Two Questions

What was the best target market? The team felt Hit Song Science could be valuable for three target markets: record labels, producers, and unsigned artists.

- For **record labels**, HSS could be helpful in at least three ways: in deciding whether to market an album, in selecting which song to release first, and even in testing new artists looking for a record deal.
- For **producers**, HSS offered a chance to test songs or albums at some stage during the production process and "tweak" them to maximize their hit potential.
- For **unsigned artists**, HSS could add value in that it helped them check the hit potential of their songs and thus find out whether they had a shot at making it in the industry.

In light of the budgetary and time constraints, McCready thought Polyphonic should initially limit itself to one target market. Several questions ran through his mind. Which market would represent the largest opportunity for Polyphonic? Where would the company achieve the highest return on its efforts? And where could it generate sales relatively quickly? In addition, within each market, should Polyphonic aim for a specific type of customer?

What was a suitable marketing plan? Once a decision on the target market had been made, the management team had to develop a marketing plan for that target market. They had decided to sell reports based on the HSS technology—and not the exclusive rights to the technology itself, for example—but several other questions remained.

- **How should HSS be positioned?** Specifically, what benefit of HSS should be emphasized for the chosen target market?
- **What price should be charged?** What price would allow Polyphonic to break even on HSS? Was the price for call-out research a good guideline for pricing decisions? Or was a higher price justified?
- **How should Polyphonic approach the selling process?** The management team realized its budget did not allow for much advertising and favored a proactive selling approach.

Related to the pricing decision, the Polyphonic team also debated whether it was worthwhile to offer potential customers a free trial. "We have received some requests for free trials from people who have heard about us, and we expect more calls when we generate more publicity," said Executive Chairman Jimena Llopis. "We are keen to prove our concept," she continued, "but we are unsure whether handing out free trials left and right is a good strategy."

"We need people to really understand what our product does and reach the right people with our message," said McCready. He pointed to the report on the Norah Jones album that Polyphonic had prepared for Blue Note Records (see **Exhibit 8**). "It may be a bit overwhelming at first to read these reports, but eventually people will recognize what we bring to the table."

When it came to designing a sales procedure, the management team recognized the need to act decisively. They had acquired three relevant industry directories: the "A&R Registry," which provided contact details for A&R people at major and independent labels (see **Exhibit 9** for a sample page); the "Producer Registry," which listed over 1,600 producers and engineers along with their selected credits and contact details; and Billboard's "International Talent and Touring Guide" with contacts for about 10,000 artists. Where and how should the team start?

Music and Math: A Challenging Mix

Polyphonic's managers knew that marketing HSS would not be easy, but they were encouraged by initial responses from potential customers who had been asked to test the product. For instance, Hollywood Records executive Bunt had been enthusiastic: "This business has always been run by instinct and gut, and even my own colleagues might have a hard time believing this, but my experiences with Hit Song Science have been fantastic. HSS has been extremely accurate on the tracks that we have taken to commercial radio."

Producer Wake agreed: "When this product came along I was very skeptical. So I put together a crazy album with some really bad songs and some really good ones, just to see what would happen. When Mike sent a report back, it clearly showed the duds and the hits. Now that I have tested it, I realize that this is an amazing tool for producers."

However, not all music industry insiders were impressed, initial sales pitches had met with considerable resistance, and early news reports on HSS voiced some concerns. "What creates a hit is that people have an emotional reaction to a song, in particular the lyrics. It is difficult to believe that a machine could gauge that," said one artist manager quoted in *The New York Times*.[4] Another musician added, "I doubt pop music could get any worse" and called it "a meaningless tool." "There are always musicians who will do something different," argued a third expert. "They could possibly be missed out if the industry pensions off A&R people and relies too much on this data-crunching machine."

"Hit Song Science is to the music industry what the X-ray machine was to medicine. The first time someone told a doctor he could look inside a patient's body without cutting it open, it probably sounded like science fiction too," said McCready about the challenge in front of him. "But in the end, the X-ray machine is a tool that helps the doctor see something that he could not see before, and he can use that information to make better decisions. That is exactly what Hit Song Science does, and that is what matters. I know that we are just a millimeter away from this thing taking off."

[4] "Antiwar Song, With Whimsey," *The New York Times*, March 12, 2003.

Exhibit 1 Biographies for Polyphonic's Management Team and Advisory Board

Management Team

Jimena Llopis (Executive Chairman) joined Grupo AIA in July 1998. She started in the Banking and Finance Unit, where she later held the position of Assistant Manager. In 2000 she created the Internet and Telecommunications Business Unit, and was the Director of this Unit until 2002. She is currently Group AIA's Vice President of New Business Development. Llopis holds Bachelor and Master's degrees (with honors) in Mathematics from the Universidad Simon Bolivar, and a Ph.D. degree in Sciences at the Universidad Central, both in Venezuela. She has held various research positions, including a tenured professorship at Universidad Simon Bolivar, and visiting positions at the Massachusetts Institute of Technology and the Mathematical Science Research Institute at Berkeley. Since 2002, she is also a researcher at Barcelona's Pompeu Fabra University. Llopis studied Music, including piano, harmony, counterpoint and composition, for twelve years at the Music School Juan Jose Landaeta in Venezuela.

Mike McCready (Chief Executive Officer) is an experienced entrepreneur and marketing executive at companies like ConsumerDesk and IconMedialab. He has spent several years within the music industry, five of which as a marketing manager at Barcelona Promoció, a firm that manages the Olympic venues in Barcelona including the Palau Sant Jordi and the Olympic Stadium. At Barcelona Promoció, he worked on the contracting of many of the city's major concerts and was responsible for bringing large events to Barcelona, including the 2002 MTV European Music Awards. McCready also consulted for Swedish music portal deo.com. Mike is a hobbyist musician. In 2000, he became the first American to publish a CD in Catalan, which was released by the second largest independent music label in Catalonia, DiscMedi.

Tracie Reed (Vice President, North America) is an experienced music retail executive in both the U.K. and the U.S. She worked as a senior executive for The Music Land Group for eight years, four of which she spent in London opening new stores for the company. She held a variety of marketing and merchandising positions at the company's Minneapolis headquarters and was the Director of Merchandising for the Superstore Division before leaving the company to work in the senior merchandising position at CDNOW, one of the largest online music retailers. At CDNOW she was responsible for brokering partnerships and large strategic relationships, among other things. She helped sell CDNOW to BMG before leaving the company. Reed also has consulted for independent music labels, artists, and retailers.

Advisory Board (Selected Members)

Lorin Hollander made his Carnegie Hall debut at the age of eleven. A child prodigy who composed music at age three and performed the Well-Tempered Clavier of Bach at five, he has since performed with every major symphony orchestra in the world and is a veteran of nearly 2,500 performances: with orchestra, in recital, lecture/recital, chamber ensemble as pianist, symphony and choral conductor. He has collaborated with Bernstein, Mehta, Ozawa, Monteux, and Szell, among many others. He performed in the soundtrack of the movie "Sophie's Choice," and has recorded for RCA Victor, Columbia, Angel and Delos and PianoDisc.

Thomas D. Mottola is one of the most highly regarded and influential executives in the music business. He most recently served as Chairman and CEO Sony Music Entertainment. During his tenure, he transformed Sony into a highly successful global music company. Along the way, he developed and nurtured many of popular music's top icons, from Celine Dion, Barbra Streisand, Bruce Springsteen, and Gloria Estefan, to Destiny's Child, Jennifer Lopez, Mariah Carey, and Nas, among others. Mottola joined Sony (then CBS Records) in 1988 as the youngest President in CBS history. Prior to joining CBS, Mottola was a prominent artist manager, and successfully launched the careers of artists such as Hall & Oates, Carly Simon and John Mellencamp.

Vic Sarjoo is a money manager, investment banker and business consultant. He has worked for Merrill Lynch, Chase and Citicorp, and founded VSAM Global Asset Management, a private investment management and investment banking boutique, in 1998.

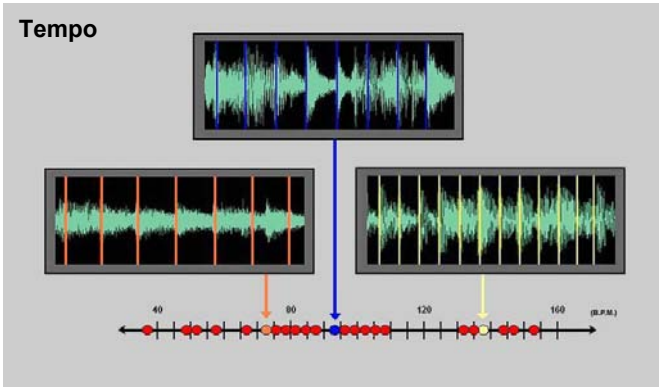
Antoni Trias is the creator of much of the core technology that drives Polyphonic HMI's music analysis tool. He holds a Ph.D. degree (Cum Laude) in Physics from the Universidad Autónoma de Barcelona. He was a visiting postdoctoral research fellow from 1974 to 1976 at the Lawrence Berkeley Laboratory of the University of California. Later, he was a tenured professor in Theoretical Physics at the Universidad Simón Bolívar in Venezuela, and a visiting professor at the State University of New York in Stony Brook (where he worked with Nobel Prize Laureate C.N. Yang, among others). In 1985 he returned to Spain, where he taught at the Universitat Autónoma de Barcelona, and the Universitat Politècnica de Catalunya. Trias is a founding partner, Vice Chairman, and R&D Director of AIA.

Ric Wake presides over a musical empire that encompasses The W&R Group, a thriving production company, Notation Music, a publishing division which oversees the work of 30 songwriters and whose success include covers by Jennifer Lopez, Marc Anthony, and Celine Dion, and two state of the art recording studios. Since the late 1980s, when he masterminded a string of hits for newcomer Taylor Dayne, Wake has been a highly successful producer and remixer. Among the projects he has been involved in are Mariah Carey's hit "Someday" and Jennifer Lopez's "Love Don't Cost A Thing." He produced and remixed four multi-platinum Celine Dion albums, and scored a Grammy Award for producing the multi-platinum soundtrack to the film "Chicago: The Musical."

Source: Polyphonic HMI.

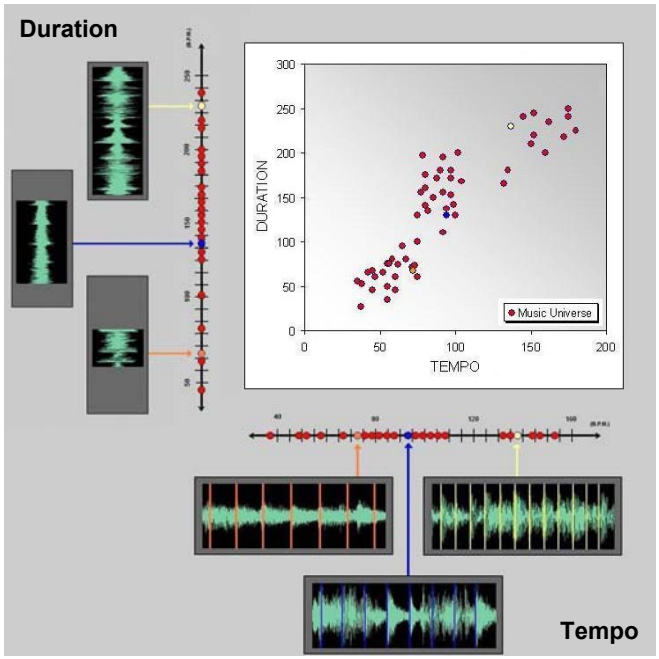
Exhibit 2 Polyphonic's Technology: The Basics

- Polyphonic considered 25 characteristics of music, including beat, chord progression, duration, fullness of sound, harmony, melody, octave, pitch, rhythm, sonic brilliance, and tempo.
- In a process known as "spectral deconvolution," it isolated each of the patterns in a song, compared them on an appropriate scale, and scored each song accordingly. For example, for tempo, the process could be depicted as follows:



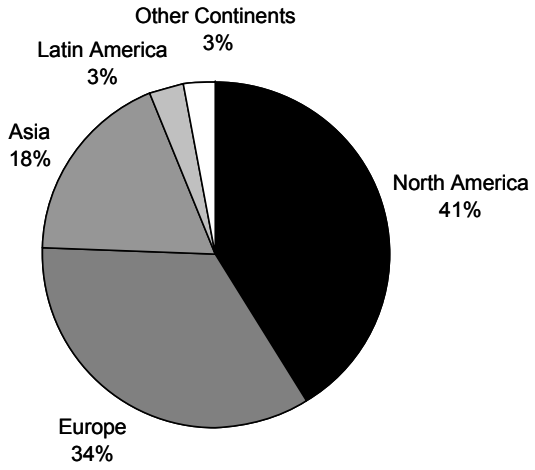
The figure shows three fragments of songs, each with a distinct temporal pattern and each scored accordingly. As indicated on the scale (where each dot represents one song), the one on the left has the slowest, and the one on the right the fastest pace.

- Based on its scores on the characteristics, each song was mapped onto a multidimensional grid called the "music universe." The below figure illustrates the process for two characteristics (i.e., two dimensions), namely tempo and duration:



Source: Polyphonic HMI.

Exhibit 3a Regions' Share of Music Sales, 2002



Source: Adapted from International Federation of the Phonographic Industry (IFPI).

Exhibit 3b Top 10 Music Markets, by Retail Value, 2002

	Units (in millions)						Retail Value ($ millions)	Annual Growth in Unit Sales
	Singles	LPs[a]	MCs[b]	CDs	DVD	VHS		
U.S.	8.4	1.7	32.4	803.3	10.7	3.5	12,609	-10.4%
Japan	77.1	2.2	4.6	228.9	11.0	2.1	5,001	-9.9%
U.K.	52.5	2.2	1.9	221.6	3.6	1.5	2,936	-0.9%
Germany	39.0	1.1	14.3	179.4	3.8	3.3	2,091	-4.7%
France	40.5	0.5	5.0	130.4	3.1	0.8	2,070	3.1%
Canada	0.6	-	1.1	57.0	1.6	1.2	621	-5.4%
Italy	3.5	0.0	3.4	36.8	0.4	0.2	565	9.3%
Spain	2.2	0.0	2.4	61.7	0.5	0.0	551	-17.9%
Australia	11.9	0.0	0.6	49.2	2.4	0.2	532	-3.0%
Mexico	0.6	0.0	2.9	51.1	-	0.9	462	-3.3%
Top 10 Markets	**236.3**	**7.7**	**68.6**	**1819.4**	**37.1**	**13.7**	**22,442**	
All Markets	**265.0**	**8.6**	**478.9**	**2,247.1**	**63.6**	**16.1**	**32,281**	

Source: Adapted from International Federation of the Phonographic Industry (IFPI).

[a] LP denotes "long-playing phonograph record."

[b] MC denotes "microcassette."

Exhibit 4 U.S. Music Manufacturers' Unit Shipments and Dollar Value (in millions)

	1994	1995	1996	1997	1998	1999	2000	2001	2002
CD Album									
Units Shipped	662	723	779	753	847	939	943	882	803
Dollar Value[a]	8,465	9,377	9,935	9,915	11,416	12,816	13,215	12,909	12,044
CD Single									
Units Shipped	9	22	43	67	56	56	34	17	5
Dollar Value	56	111	184	273	213	222	143	79	20
Cassette									
Units Shipped	345	273	225	173	159	124	76	45	31
Dollar Value	2,976	2,304	1,905	1,523	1,420	1,062	626	363	210
Music Video									
Units Shipped	11	13	17	19	26	17	15	10	4
Dollar Value	231	220	236	324	496	311	202	138	52
DVD Audio									
Units Shipped	-	-	-	-	-	-	-	0	0
Dollar Value	-	-	-	-	-	-	-	6	9
DVD Video									
Units Shipped	-	-	-	-	1	3	3	8	11
Dollar Value	-	-	-	-	12	66	80	191	236
Other[b]									
Units Shipped	106	96	90	72	60	39	23	16	9
Dollar Value	571	528	510	527	650	419	261	191	96
Total Units[c]	**1,123**	**1,113**	**1,137**	**1,063**	**1,124**	**1,161**	**1,079**	**969**	**860**
Total Value	**12,068**	**12,320**	**12,534**	**12,237**	**13,711**	**14,585**	**14,324**	**13,741**	**12,614**

Source: Adapted from Recording Industry Association of America (RIAA).

[a]Dollar value reflects the total suggested retail list prices of shipments.

[b]Includes cassette single, LP/EP, and vinyl single.

[c]Total units and total value include shipments to retail and direct and special markets.

Exhibit 5 Profile of Music Consumers[a]

	1994	1995	1996	1997	1998	1999	2000	2001	2002
What genre was purchased?									
Rock	35.1	33.5	32.6	32.5	25.7	25.2	24.8	24.4	24.7
Rap/Hip-Hop[b]	7.9	6.7	8.9	10.1	9.7	10.8	12.9	11.4	13.8
R&B/Urban[c]	9.6	11.3	12.1	11.2	12.8	10.5	9.7	10.6	11.2
Country	16.3	16.7	14.7	14.4	14.1	10.8	10.7	10.5	10.7
Pop	10.3	10.1	9.3	9.4	10.0	10.3	11.0	12.1	9.0
Religious[d]	3.3	3.1	4.3	4.5	6.3	5.1	4.8	6.7	6.7
Classical	3.7	2.9	3.4	2.8	3.3	3.5	2.7	3.2	3.1
Jazz	3.0	3.0	3.3	2.8	1.9	3.0	2.9	3.4	3.2
Soundtracks	1.0	0.9	0.8	1.2	1.7	0.8	0.7	1.4	1.1
Oldies	0.8	1.0	0.8	0.8	0.7	0.7	0.9	0.8	0.9
New Age	1.0	0.7	0.7	0.8	0.6	0.5	0.5	1.0	0.5
Children's	0.4	0.5	0.7	0.9	0.4	0.4	0.6	0.5	0.4
Other[e]	5.3	7.0	5.2	5.7	7.9	9.1	8.3	7.9	8.1
In which format?									
Full-length CDs	58.4	65.0	68.4	70.2	74.8	83.2	89.3	89.2	90.5
Full-length cassettes	32.1	25.1	19.3	18.2	14.8	8.0	4.9	3.4	2.4
Singles (all types)	7.4	7.5	9.3	9.3	6.8	5.4	2.5	2.4	1.9
Music videos/video DVDs	0.8	0.9	1.0	0.6	1.0	0.9	0.8	1.1	0.7
DVD audio	NA	NA	NA	NA	NA	NA	NA	1.1	1.3
Digital download	NA	NA	NA	NA	NA	NA	NA	0.2	0.5
Vinyl LPs	0.8	0.5	0.6	0.7	0.7	0.5	0.5	0.6	0.7
Through which channel?									
Record store	53.3	52.0	49.9	51.8	50.8	44.5	42.4	42.5	36.8
Other store	26.7	28.2	31.5	31.9	34.4	38.3	40.8	42.4	50.7
Tape/record club	15.1	14.3	14.3	11.6	9.0	7.9	7.6	6.1	4.0
TV, newspaper, magazine ad or 800 number	3.4	4.0	2.9	2.7	2.9	2.5	2.4	3.0	2.0
Internet[f]	NA	NA	NA	0.3	1.1	2.4	3.2	2.9	3.4

Source: Adapted from Recording Industry Association of America (RIAA).

[a] Peter Hart Research conducts a national telephone survey of past-month music buyers (over 2,900 per year). Data from the survey is weighted by age and sex and then projected to reflect the U.S. population age 10 and over. The reliability of the data is +/– 1.8% at a 95% confidence level. With respect to genre, consumers were asked to classify their music purchases; they are not assigned a particular category by Hart Research.

[b] "Rap": Includes rap and hip-hop.

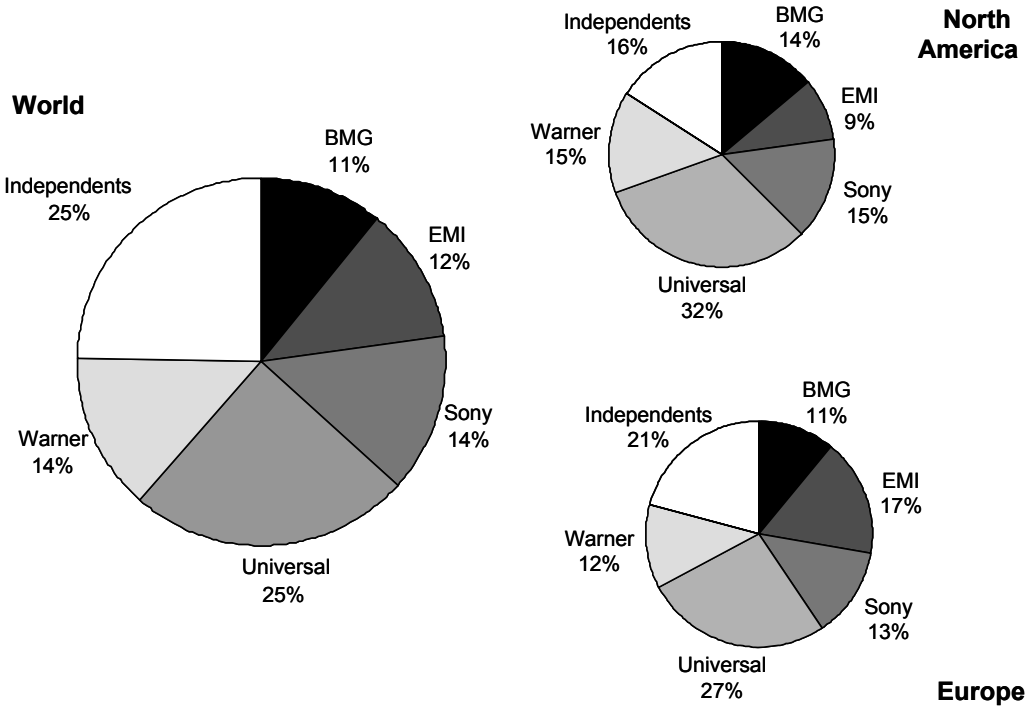
[c] "R&B": Includes R&B, blues, dance, disco, funk, fusion, Motown, reggae, soul.

[d] "Religious": Includes Christian, gospel, inspirational, religious, and spiritual.

[e] "Other": Includes ethnic, standards, big band, swing, Latin, electronic, instrumental, comedy, humor, spoken word, exercise, language, folk, and holiday music.

[f] "Internet": Does not include record club purchases made over the Internet.

Exhibit 6 Major Record Companies' Share of Music Sales (2002)



Source: Adapted from International Federation of the Phonographic Industry (IFPI).

Exhibit 7a Top 25 Albums in the U.S. in 2002

#	Album	Artist	Label	Unit Sales
1	The Eminem Show	Eminem	Web/Aftermath/Interscope	7,608,000
2	Nellyville	Nelly	Fo'Reel/Universal	4,916,000
3	Let Go	Avril Lavigne	Arista	4,121,000
4	Home	Dixie Chicks	Monument/Columbia/CRG	3,690,000
5	8 Mile	Soundtrack	Shady/Interscope	3,498,000
6	Missundaztood	Pink	Arista	3,145,000
7	Ashanti	Ashanti	Murder Inc./AJM/IDJMG	3,100,000
8	Drive	Alan Jackson	Arista Nashville/RLG	3,055,000
9	Up!	Shania Twain	Mercury Nashville	2,909,000
10	O Brother, Where Art Thou?	Soundtrack	Lost Highway/Mercury/IDJMG	2,736,000
11	Come Away With Me	Norah Jones	Blue Note/Capitol	2,661,000
12	A New Day Has Come	Celine Dion	Epic	2,645,000
13	Josh Groban	Josh Groban	143/Respire/Warner Bros.	2,569,000
14	Now That's What I Call Music 9	Various Artists	Universal/EMI/Zomba/Sony/UMRG	2,451,000
15	Elvis 30 #1 Hits	Elvis Presley	RCA	2,445,000
16	Weathered	Creed	Wind-Up	2,338,000
17	Hybrid Theory	Linkin Park	Warner Bros.	2,139,000
18	Cry	Faith Hill	Warner Bros. Nashville/WRN	2,089,000
19	Come Clean	Puddle of Mudd	Flawless/Geffen/Interscope	2,071,000
20	Unleashed	Toby Keith	Dreamworks Nashville/Interscope	2,019,000
21	No Shoes No Shirt No Problems	Kenny Chesney	BNA/RLG	2,001,000
22	Word Of Mouf	Ludacris	Disturbing Tha Peace/Def Jam	1,977,000
23	Laundry Service	Shakira	Epic	1,951,000
24	Silver Side Up	Nickelback	Roadrunner/IDJMG	1,921,000
25	Room For Squares	John Mayer	Aware/Columbia/CRG	1,856,000

Source: Adapted from *Billboard Magazine.*

Exhibit 7b Top 25 Singles in the U.S. in 2002

#	Song	Artist	Label
1	How You Remind Me	Nickelback	Roadrunner/IDJMG
2	Foolish	Ashanti	Murder Inc./AJM/IDJMG
3	Hot In Herre	Nelly	Fo' Reel/Universal/UMRG
4	Dilemma	Nelly Featuring Kelly Rowland	Fa' Rell/Universal/UMRG
5	Wherever You Will Go	The Calling	RCA
6	A Thousand Miles	Vanessa Carlton	A&M/Interscope
7	In The End	Linkin Park	Warner Bros.
8	What's Luv?	Fat Joe Featuring Ashanti	Terror Squad/Atlantic
9	U Got It Bad	Usher	Arista
10	Blurry	Puddle of Mudd	Flawless/Geffen/Interscope
11	Complicated	Avril Lavigne	Arista
12	Always On Time	Ja Rule Featuring Ashanti	Murder Inc./Def Jam/IDJMG
13	Ain't It Funny	Jennifer Lopez Featuring Ja Rule	Epic
14	The Middle	Jimmy Eat World	DreamWorks
15	I Need A Girl (Part One)	P. Diddy Featuring Usher & Loon	Bad Boy/Arista
16	U Don't Have To Call	Usher	Arista
17	Family Affair	Mary J. Blige	MCA
18	I Need A Girl (Part Two)	P. Diddy & Ginuwine	Bad Boy/Arista
19	Gangsta Lovin'	Eve Featuring Alicia Keys	Ruff Ryders/Interscope
20	My Sacrifice	Creed	Wind-up
21	Without Me	Eminem	Web/Aftermath/Interscope
22	Hero	Enrique Iglesias	Interscope
23	All You Wanted	Michelle Branch	Maverick/Warner Bros.
24	Get The Party Started	Pink	Arista
25	Hero	Chad Kroeger Featuring Josey Scott	Columbia/Roadrunner/IDJMG

Source: Adapted from *Billboard Magazine*.

Exhibit 8 Hit Song Science: A Sample Report[a]

HSS Analysis Report
Blue Note Records

Polyphonic HMI
Human Media Interface

Artist: Norah Jones
Album: Come Away With Me

Album Summary:

Track		HSS Song Rating	HSS Classic Hit Rating	HSS Recentness Rating	HSS Sales Rating
(01) Norah Jones - Don't Know Why		7,21	6,07	6,18	NA
(02) Norah Jones - Seven Years		4,55	5,65	7,97	NA
(03) Norah Jones - Cold Cold Heart	▼	3,31	4,68	7,39	NA
(04) Norah Jones - Feelin' The Same Way		7,29	6,18	6,79	NA
(05) Norah Jones - Come Away With Me		6,97	5,73	6,85	NA
(06) Norah Jones - Shoot The Moon		7,15	6,01	6,37	NA
(07) Norah Jones - Turn Me On		7,32	5,96	7,37	NA
(08) Norah Jones - Lonestar		7,26	5,90	6,07	NA
(09) Norah Jones - I've Got To See You Again	▲	7,59	5,95	5,69	NA
(10) Norah Jones - Painter Song		7,12	5,39	6,97	NA
(11) Norah Jones - One Flight Down		6,13	4,97	6,53	NA
(12) Norah Jones - Nightingale		6,82	4,86	4,53	NA
(13) Norah Jones - The Long Day Is Over		6,29	5,72	7,12	NA
(14) Norah Jones - The Nearness Of You		7,03	5,58	7,04	NA
Global Album Rating:		6,68	5,64	6,70	NA

Key
▲ - Top Rated Song
▼ - Bottom Rated Song

[a]A song that scores an **HSS Song Rating** of 7.0 or above is considered to have mathematical hit potential. A song with a score between 6.75 and 6.99 is considered to have the ability to perform in the market with extra promotion effort and investment. A high HSS Song Rating combined with an **HSS Classic Hit Rating** of 5.5 or greater is considered a song with staying power, which is determined by comparing it to characteristics of classic hits. Finally, a score of 7.0 or higher on the **HSS Recentness Rating** is considered to be a good indicator of its hit potential based on characteristics of recent hits.

Exhibit 8 (continued)

HSS Analysis Report
Blue Note Records

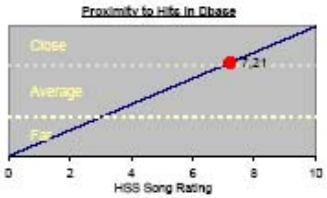
Polyphonic HMI
Human Media Interface

Artist: Norah Jones
Album: Come Away With Me

Song Detail:

Song: Don't Know Why

HSS Song Rating:	**7,21**
HSS Recentness Rating:	6,18
HSS Sales Rating:	NA
HSS Classic Hit Rating:	6,07



HSS Song Rating:	7,21

Proximity to Hit Songs:

Hit Song	Affinity Value	Single Sales To Date	Album Sales To Date	Release Date
1. Voices Of Theory -- Say It	0,42	0	NA	23/05/1996
2. Lee Ann Womack With Sons Of The Desert -- I Hope You Dance	0,59	0	NA	27/01/2001
3. LeAnn Rimes -- Can't Fight The Moonlight	0,59	0	NA	09/09/2000
4. Boyz II Men -- Thank You In Advance	0,62	0	NA	30/12/2000
5. Shania Twain -- From This Moment On	0,65	0	NA	12/05/1998
6. Nine Inch Nails -- The Day The World Went Away	0,67	0	NA	08/07/1999
7. Mo Thugs Family -- Ghetto Cowboy	0,71	0	NA	21/11/1996

HSS Recentness Rating:	6,18
HSS Sales Rating:	NA

HSS Classic Hit Rating:	6,07

Proximity to Classic Hit Songs:

Classic Hit Song	Affinity Value
1. Blind Melon -- No Rain	0,68
2. Paul Revere and the Raiders -- Indian Reservation	0,80
3. Santana -- Oye Coma Va	0,95
4. Squeeze -- Tempted	0,96
5. Argent -- Hold Your Head Up	1,09

HSS Analysis Report
Blue Note Records

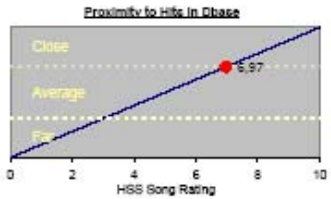
Polyphonic HMI
Human Media Interface

Artist: Norah Jones
Album: Come Away With Me

Song Detail:

Song: Come Away With Me

HSS Song Rating:	**6,97**
HSS Recentness Rating:	6,85
HSS Sales Rating:	NA
HSS Classic Hit Rating:	5,73



HSS Song Rating:	6,97

Proximity to Hit Songs:

Hit Song	Affinity Value	Single Sales To Date	Album Sales To Date	Release Date
1. Brian McKnight -- Win	0,27	0	NA	23/12/2000
2. Brandy Moss-Scott -- Bye-Bye Baby	0,48	0	NA	10/06/2001
3. Sarah McLachlan -- Angel	0,51	0	NA	27/02/1999
4. Jessica Andrews -- Unbreakable Heart	0,66	0	NA	29/04/2000
5. Xscape -- The Arms Of The One Who Loves You	0,77	0	NA	05/02/1998
6. Uncle Sam -- I Don't Ever Want To See You Again	0,80	0	NA	01/03/1996
7. R. Kelly -- If I Could Turn Back The Hands Of Time	0,86	0	NA	09/10/1999

HSS Recentness Rating:	6,85
HSS Sales Rating:	NA

HSS Classic Hit Rating:	5,73

Proximity to Classic Hit Songs:

Classic Hit Song	Affinity Value
1. Dave Mason -- The Lonely One	1,11
2. Culture Club -- Do You Really Want To Hurt Me	1,51
3. Chris DeBurgh -- Lady In Red	1,52
4. Argent -- Hold Your Head Up	1,79
5. Poco -- You Better Think Twice	1,81

Exhibit 8 (continued)

HSS Analysis Report
Blue Note Records

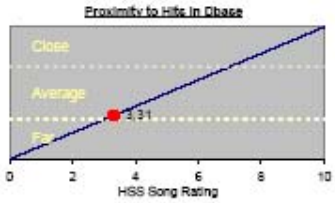
Polyphonic HMI
Human Media Interface

Artist: Norah Jones
Album: Come Away With Me

Song Detail:

Song: Cold Cold Heart

HSS Song Rating:	3,31
HSS Recentness Rating:	7,39
HSS Sales Rating:	NA
HSS Classic Hit Rating:	4,68



HSS Song Rating:	3,31

Proximity to Hit Songs:

Hit Song	Affinity Value	Single Sales To Date	Album Sales To Date	Release Date
1. JT Money Featuring Sole -- Who Dat	1,14	0	NA	24/04/1999
2. Cuban Link -- Flowers For The Dead	1,33	0	NA	24/06/2000
3. Truth Hurts Featuring Rakim -- Addictive	1,41	0	NA	05/04/2002
4. Pink -- There You Go	1,57	0	NA	03/04/2000
5. Petey Pablo -- Raise Up	1,63	0	NA	08/11/2001
6. Sole Featuring JT Money & Kandi -- 4, 5, 6	1,76	0	NA	18/12/1999
7. R.L., Snoop Dogg & Lil' Kim -- Do U Wanna Roll (Dolittle Theme)	1,80	0	NA	

HSS Recentness Rating:	7,39
HSS Sales Rating:	NA

HSS Classic Hit Rating:	4,68

Proximity to Classic Hit Songs:

Classic Hit Song	Affinity Value
1. Loggins and Messina -- House At Pooh Corner	2,17
2. The Buggles -- Video Killed The Radio Star	3,73
3. Spirit -- Nature's Way	4,07
4. Blood, Sweat & Tears -- You've Made Me So Very Happy	4,24
5. Jim Diamond -- I Should Have Known Better	4,27

HSS Analysis Report
Blue Note Records

Polyphonic HMI
Human Media Interface

Artist: Norah Jones
Album: Come Away With Me

Song Detail:

Song: I've Got To See You Again

HSS Song Rating:	7,59
HSS Recentness Rating:	5,89
HSS Sales Rating:	NA
HSS Classic Hit Rating:	5,95

HSS Song Rating:	7,59

Proximity to Hit Songs:

Hit Song	Affinity Value	Single Sales To Date	Album Sales To Date	Release Date
1. Christina Aguilera -- What A Girl Wants	0,22	0	NA	15/01/2000
2. Chico DeBarge -- Give You What You Want (Fa Sure)	0,31	0	NA	23/10/1999
3. Janet Featuring BLACKstreet -- I Get Lonely	0,39	0	NA	23/05/1998
4. Xscape -- The Arms Of The One Who Loves You	0,41	0	NA	05/02/1996
5. Jon B. -- They Don't Know	0,49	0	NA	
6. Travis Tritt -- Best Of Intentions	0,49	0	NA	16/09/2000
7. All Saints -- Never Ever	0,50	0	NA	25/07/1998

HSS Recentness Rating:	5,89
HSS Sales Rating:	NA

HSS Classic Hit Rating:	5,95

Proximity to Classic Hit Songs:

Classic Hit Song	Affinity Value
1. The Hollies -- The Air That I Breathe	1,24
2. Chris DeBurgh -- Lady In Red	1,25
3. Richard Marx -- Hazard	1,26
4. Wang Chung -- Dance Hall Days	1,29
5. Spirit -- Nature's Way	1,30

Source: Polyphonic HMI.

Exhibit 9 The A&R Registry: A Sample Page

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Source: The Music Business Registry, Inc.