Designing for Authenticity: The Steinway “D” Grand Piano

Gino Cattani
Roger L M Dunbar
Zur Shapira

Stern School of Business
New York University
40 West 4th St. New York NY 10012
USA

November 18th 2013
Designing for Authenticity: The Steinway “D” Grand Piano

Abstract

Authenticity is a socially constructed phenomenon within a socially desirable category. While authenticity is always socially constructed, i.e., involves evaluations by audiences such as peers, critics or users, authenticity claims are generally more credible as they are embedded in core features of organizations. To illustrate, we focus on the pianos made by Steinway & Sons. Building upon Thompson’s (1967) organization design ideas of input, technical core, and output activities, we trace out how Steinway & Sons sought audience recognition and prestige by expanding its technical core in ways that were intended to influence perceptions of Steinway piano authenticity. Our study also shows how when Steinway & Sons was challenged by competition and threatened by other external events, the authenticity audiences associated with its pianos acted as a buffer giving the firm time to adjust and change and so exhibit resilience. The implications for research on organization design and authenticity are discussed.

Key Words: Authenticity; Craft; Technical Core; Historical Case; Steinway & Sons.
INTRODUCTION

Authenticity is a socially constructed phenomenon. A product or service is considered authentic to the extent that audiences (e.g., users, critics, peers, etc.) recognize it as genuine and real (Trilling, 1972; Peterson, 1997, 2005; Fine, 2004; Rao, Monin and Durand, 2005; Carroll and Wheaton, 2009). There is no objective determination of authenticity “because interpretations vary across audiences and change across time” (Kovács, Carroll and Lehman, 2013: 3). Yet authenticity claims are often perceived to be more genuine or real if they are embedded in core organizational features. Such claims “gain more attention, gather stronger appeal, convey better credibility and persist longer than those which are not effectively organizationally embedded” (Carroll and Wheaton, 2009: 257).

If organizations want audiences to perceive their products or services as authentic, they may make claims about the exceptional, unique characteristics of what they offer and contrive strategies intended to build authenticity. Yet authenticity is recognized only after it has been achieved and once audiences recognize it, they usually expect producers to consistently maintain high quality using established and accepted techniques, tools and processes (Peterson, 1997, 2005; Glynn and Lounsbury, 2005; Rao et al., 2005; Kovács et al., 2013). While previous research focused on how audiences evaluate authenticity claims, the specific decisions and activities organizations use to build, maintain and support perceptions of authenticity have received less attention. To the extent that authenticity claims are embedded in organizational features, authenticity may not only be socially constructed but also grounded in core aspects of organizational designs that audiences recognize.

To theorize about how organizations may first create and then maintain authenticity, we build upon Thompson’s (1967) organization design elements (input, technical core, and output activities) and we trace out how Steinway & Sons managed these aspects. Thompson’s original framework assumes that the organizational design elements are given and then explains how an organization works at a particular point in time. In contrast, we use his framework to highlight how
the elements of an organizational design have to be developed and then integrated. Specifically, a category of product or service is not always given but may have to be identified, and this usually requires the identification of a potential use. Once the potential use is recognized, a period of development involving new technological inputs and audiences evaluating products or services occurs, and the necessary elements in a firm’s technical core emerge. As technologies develop, competition between producers also develops as they endeavor to differentiate their offerings even as audiences endeavor to evaluate them. As audiences decide a particular organization produces an authentic product, both the product and the organization gain recognition and prestige.

Relying on a unique dataset that combines primary and secondary sources, including the Steinway & Sons archives housed at LaGuardia Community College in New York, we use an historical case study research design to examine how the firm developed its production process – its technical core – and how, eventually, audiences attributed authenticity to the pianos it made. The study covers a period from around 1700 to the 1970s. We begin by discussing how consensus was reached concerning the potential of the piano to be a socially desirable category of musical performance instrument. Competition then developed among piano makers who introduced many technological developments to improve piano performance that audiences then compared to assess which was the best. Steinway & Sons entered the industry as a startup firm in 1853. We describe how it developed its pianos, and sought and gained recognition for them. In particular, we consider the contributions Steinway & Sons made to piano making technology, and how this led to the development of the Steinway “D” grand piano that became the preferred piano for concert performances. Finally, we describe how audience attributions of authenticity to Steinway & Sons’ pianos functioned as a buffer that helped the firm deal with a series of threatening events.
**THEORY**

Authenticity has two different meanings. The first refers to whether a product or service meets the criteria for being included as a member of a particular type, genre or category (Carroll and Wheaton, 2009). This usage presupposes the existence of the associated category, which is a culturally defined classification that a broad audience agrees upon (DiMaggio, 1987; Douglas, 1986; Hannan, Pólos and Carroll, 2007; Zuckerman, 1999). For instance, the category “piano” as a musical performance instrument had first to be recognized and agreed upon before manufacturing technologies developed to support and improve its performance. In parallel, however, as the locations where pianos were used also evolved, so different piano subcategories emerged – squares and uprights for use in homes, and grand pianos for use in concert performances. Inclusion in a category or a subcategory requires that its members meet the size, shape and performance criteria associated with the category.

According to Carroll and Wheaton (2009: 268), after a technology has been stabilized, type authenticity is “transformed or replaced or subsumed by a conceptually related generic dimension of authenticity that emphasizes skills and craftsmanship rather than fit to a specific type or genre.” This alternative interpretation—also known as craft authenticity—is possible only once the technology for making a product has been established, and it focuses on whether a product or service is “true to the craft” rather than true relative to an institutionalized category. Referring to restaurants, for example, Carroll and Wheaton (2009: 268) note that while many people can cook, craft authenticity “celebrates the artistry and mastery of the chef, the cooking staff and the service staff. It recognizes that the knowledge, skills and techniques of the chefs and other staff are beyond the normal person’s reach, requiring special training and apprenticeships and a range of specialized experiences.” Craft authenticity implies that the use of sophisticated craft techniques, personnel and ingredients to make a product, together, enable a sense of important and unique cultural value.
In their study of the US microbrewery movement, for example, Carroll and Swaminathan (2000) found that microbreweries and brewpubs supported their claims of being authentic craft specialty beer producers with clear evidence, whereas mass production and (particularly) contract breweries either made no such claims or used deception to make them. An authenticity claim is more credible as the production of a product or service is transparent. Transparency has “the virtue of indisputability: something an audience sees directly is not likely to be challenged, especially if it is uncommon and presented as de facto evidence. Getting a claim accepted based on non-transparent evidence is harder: it pertains to making the claim accepted as true by default, since most consumers would rather not bother with further investigation and the amount of documentation a producer might need to represent could be overwhelming” (Carroll and Wheaton, 2009: 274). This may be why authenticity claims embedded in core organizational features such as established and highly visible technological tools and processes that are known to be stable over time are more credible.

As an organization can demonstrate its products or services are made in the best way, and as the most demanding and discriminating users agree the product is the best of a particular type, then such a product may be recognized as authentic, i.e., special and unique. But how is this ‘uniqueness’ built? Authenticity building strategies require consistent efforts over time for technologies to first develop and then to stabilize so that needed craft skills can develop. Authenticity also requires that audiences recognize an organization’s product as superior to the products offered by competing organizations that serve the same function, and that recognition is more important as the audience

---

1 “Consumers buying specialty beers seek simply a malt beverage brewed in a small craftlike firm according to traditional methods and using natural ingredients. This causes many of them to balk at beverages brewed by large corporations using modern methods of mass production and to reject outright those beverages sold deceptively by a business corporation. It explains why both mass producers and contract brewers conceal their true organizational identities. It also explains why, in interactions (inspired by ethnomethodology) that we have engaged in, a crestfallen look comes on the perfectly content beer drinker when told that the specialty beer being consumed actually comes from a major brewing corporation or a company without a brewery at all. Legitimacy as a producer of specialty beers requires operating a brewing facility” (Carroll and Swaminathan, 2000: 728-729).
includes users who know how the instrument is made and used, and the number of such users increases indicating a consensus based on knowledge and expertise.

It took over 50 years until around the middle of the 18\textsuperscript{th} century for the piano to move from being seen as simply a technical novelty, to being recognized as potentially, a new category of performance instrument. Once this potential was recognized, many new audiences became interested in assessing the piano and many new manufacturing issues emerged that took piano makers decades to resolve. It was the grand piano that was most often used in concerts as a performance instrument, and so audiences (performers, public and critics) most often focused on comparing and assessing grand piano performance. The eventual attribution of authenticity to the Steinway “D” grand piano towards the end of the 19\textsuperscript{th} century was based on a consensus assessment reached by virtuoso piano performers, composers, and high-status cultural audiences. By developing new patented technologies and also by emphasizing the use of “true to the craft” techniques, tools and processes gradually perfected over time to enhance the power of its piano in concert performances, Steinway & Sons differentiated its concert grand piano from the concert grand pianos built by competing firms.

Thompson (1967: 12) argued that organizations must “approach certainty at the technical level to satisfy its rationality criteria, but must remain flexible and adaptive to satisfy environmental requirements …” As an organization can reduce its dependence on its task environment, it can exert more control. Thompson argued that acquiring prestige is the “cheapest” way of acquiring power (1967: 33). The prestige Steinway & Sons gained from the recognition accorded to it by virtuoso performers, critics, composers and users greatly enhanced its power in the classical music world and also reduced the risk that its main audiences would question its authenticity claims. The attributions of authenticity to the Steinway piano were due to the techniques, tools, and manufacturing processes Steinway & Sons developed that have remained stable despite continuing incremental innovations.
The Steinway approach used the best available components and featured integrative piano architectures that emphasized instrument stability and sound volume. By winning manufacturers’ competitions first in the US and then against European manufacturers, and by persuading German piano makers to adopt the Steinway building approach, the Steinways continually gained status and reputation among members of knowledgeable audiences. A consensus developed amongst the various audiences – makers and performers – concerning the excellence of the Steinway building approach and this ultimately determined the authenticity attributed to the firm and its piano.

The Evolution of Authenticity: Challenges and Organizational Responses

Over time, however, organizations necessarily make tradeoffs in the extent to which they invest in their technical cores. Firms have to invest to take advantage of enhanced core technologies for if they fail to invest, the excellence of their technical core is at risk. Yet the demands on a technical core can change and sometimes, when needed technologies are not available, organizations must invent them. As virtuosi performers made improvement suggestions to Steinway & Sons that led to technical core adjustments, they became lead users who were also implicitly parts of the firm’s technical core (Von Hippel, 1986). Indeed, organizations producing authentic products often focus on their elite users and establish ongoing interactions with them, at the same time reducing the attention given to mass-market customers (e.g., Beverland, 2005; Outka, 2008; Negro, Hannan and Rao, 2010). By absorbing its elite users (coopting them), Steinway & Sons increased its power and reduced its environmental dependence (Thompson, 1967). This also enabled its technical core to evolve and change in a user-sensitive, directed way, avoiding sudden adjustments due to changes in user requirements. To the extent needed changes are not anticipated, they “interfere with the orderly operation of the core technology and thereby reduce its performance” (Thompson, 1967: 22). But if

---

2 The other general cooperative strategies are contracting, i.e., negotiating an agreement for future performance exchange, and coalescing, i.e., combining or forming a joint venture with an(other) organization(s) (Thompson, 1967: 35-37).
changes are anticipated, they act as constraints, i.e., fixed conditions an organization adapts to so that “the technical core can operate as if it enjoyed a close system” (Thompson, 1967: 22). Steinway & Sons was able to ‘anticipate’ many needed changes thanks to the close interactions it enjoyed with prominent virtuosi performers.

Authenticity claims are always under scrutiny and this becomes a pressing issue as an organization is under threat (Carroll and Wheaton, 2009: 257; Peterson, 2005). While the technical core should continually improve, the challenge is to make adjustments without undermining audience perceptions of authenticity. In addition, the authenticity claims made by competitors may directly challenge the claims of a particular firm. At the US Centennial World's Fair in Philadelphia, for example, knock-off producers bribed international judges in an effort to persuade them to report that the quality of their cheaply-made pianos was the equal of Steinway pianos (Lieberman, 1995). Steinway & Sons’ liquidity problems in the 1890s and 1960s led to cutbacks in its technical core investments, implicitly providing opportunities for competitors to challenge its claims of authenticity. During the Great Depression and in WWII, Steinway & Sons actually stopped piano production, risking the loss of the tacit piano-making knowledge built up over the years on which the credibility of its authenticity claims was based.

We explore not only how Steinway & Sons’ technical core evolved but also how the authenticity audiences associated with its piano making developed. Craft authenticity is what enables an organization to differentiate its products from the offerings of other organizations within the same category, even as audiences (e.g., users) continually reassess their relative worth. As Zuckerman (1999: 1402) noted, gaining “the favor of an audience requires conformity with the audience’s minimal criteria for what offers should look like and differentiation from all other legitimate offers.” Products failing to meet minimal criteria are simply discarded but then after meeting minimal criteria, each maker then attempts “to differentiate its offer from those advanced by its peers and
establish its relative desirability” (Zuckerman, 1999: 1402). In assessing differences, attention focuses on whether a product is made ‘true to the craft’ using appropriate craft techniques, tools and processes. For a product to be recognized as authentic, an organization must excel with respect to both its use of traditional manufacturing processes and audience assessments of product authenticity.

**METHOD**

**Research Design and Data**

We use an historical case research design to examine how Steinway & Sons built and maintained the credibility of its authenticity claims. The use of historical case study research is appropriate when the phenomenon under investigation displays complex dynamics and context-specific meanings (Hargadon and Douglas, 2001). Our study enables a refined conceptualization of how a technical core evolves and how these steps enhance perceptions of authenticity (Siggelkow, 2007). The case method allows us to identify the interplay of forces and actors and how these interacting processes unfolded over time (Kieser, 1994). Historical cases enable us to examine and evaluate social processes in ways other methods, e.g., cross-sectional and large-sample longitudinal studies cannot.

We rely on a unique dataset comprised of primary and secondary sources including the Steinway & Sons archives housed at LaGuardia Community College in New York, and articles about Steinway & Sons on the LexisNexis and Factiva databases. From the Steinway & Sons archives, we obtained the minutes of director’s meetings and firm annual reports for about a half century. Accounts that ‘look back’ often neglect concrete details that constituted and shaped actions in favor of more abstract accounts that highlight the spirit of the times. Our data enable us to establish how the firm maintained a balance between mechanized and craft work production in organizing production. The data also enables us to trace out events before and during the Great Depression
when piano production was essentially shut down and Steinway & Sons sought war work opportunities, i.e., producing wooden parts for military gliders, to help the firm survive. After WWII, Henry Z. Steinway worked closely with the factory supervisors to reestablish the firm. As far as outside relations were concerned, this was a period of vulnerability as the press questioned whether a new Steinway was as good as an old one. Later, Yamaha challenged Steinway’s exclusive links to the virtuosi community by signing Andre Watts and other virtuosi to become Yamaha rather than Steinway artists. We document how Steinway & Sons reacted to these and other challenges through the data in the Steinway & Sons archives and sources such as *The Music Trades* review and other industry journals, books (e.g., Dolge, 1911; Fostle, 1995; Lieberman, 1995) and other bibliographical sources. One of the co-authors also interviewed Henry Z. Steinway in 1995 to hear his perspective on several issues relevant to our study. We have bracketed events into successive periods that are not phases in “a predictable sequential process, but, simply, a way of structuring the description of events” (Langley, 1999: 703). By using several sources, we sought to build trust in our information, while triangulation from multiple and distinct bibliographic sources reduced the risk of biased points of view.

The case analysis is organized as follows. We start by explaining how the piano was eventually recognized as a socially desirable category of musical performance instrument and then how piano technology continued to evolve over the next century. We then consider the position of Steinway & Sons as a start-up firm in the piano-manufacturing industry and how it developed its pianos. Specifically, we describe how Steinway & Sons gradually extended its technical core to include not only piano making but all of the processes involved with piano concert performance, thanks to close relationships with leading pianists, other piano makers and university researchers and

---

a willingness to incorporate their ideas and advice to make better pianos. We argue the extension of Steinway & Sons technical core was what ultimately enabled it to make claims of product authenticity that were widely accepted and continue to be accepted. We also describe how the authentic status that worldwide audiences associate with Steinway & Sons pianos has protected the firm against external and internal challenges.

CASE ANALYSIS

The Piano as a Socially Desirable Category of Musical Performance Instrument

The earliest pianos looked like harpsichords, a keyboard instrument with an action that makes sound by using plectra to pluck strings. Bartolomeo Christofori (1655-1731), an instrument maker and curator of the Medici musical instruments in Florence, built a keyboard instrument with an action that made sound by using hammers to strike strings. His “pianoforte” (“soft and loud”) dates to around 1700. When a player pressed a keyboard note, the piano’s action enabled a hammer to hit a string. This “action” connecting a keyboard note to a hammer that hits a string is a piano’s distinguishing feature. As a player presses a key more firmly, the hammers strike harder and the piano makes a louder sound, giving a player control over the sound volume. A harpsichord player, in contrast, has no control over its soft, monotonic sound. While Christofori’s actions were a technological breakthrough, they were not a response to any recognized musical need and so initially, most musical performers had little interest in pianos. While an ability to play “soft and loud” would enable musical performance, musicians at the time did not think a harpsichord or something that looked like one was a musical performance instrument. They also did not imagine that eventually, hammer actions would enable such versatility that pianos would be both musical accompaniment and performance instruments (Good, 2001).
Through the first half of the 18th century, it was instrument makers who were interested in pianos and the technical challenges posed by its hammer actions. Gottfried Silbermann (1683-1753), an organ builder, and his nephew, Johann Heinrich Silbermann (1728-1792) from Freiberg, Germany, explored alternative designs for piano actions. Seeking recognition for the piano as a performance instrument, Gottfried showed his pianos to Frederich the Great (1712-1786) of Prussia in 1747. Frederich, a knowledgeable musician, liked Silberman’s pianos and bought them and shortly thereafter, showed them to Johann Sebastian Bach (1685-1750). Bach had not been impressed by some of Silberman’s earlier pianos but he liked the new ones and when Frederich played a theme and asked him to use it to compose a fugue, Bach responded with “The Musical Offering.” Despite these events at the palace, pianos continued to be technical novelties because no recognized performer had yet demonstrated the instrument’s performance abilities (Good, 2001; Wainwright, 1975).

In 1754, Johann Andreas Stein (1728-1792) opened an organ and instrument making workshop in Augsburg, Germany. Stein was known for organ building and also for experimenting with new instrument designs. Specifically, he designed the so-called “Viennese” fortepiano, for which the piano music of Haydn, Mozart, and the early Beethoven was written. Because the components of Stein’s piano design differed so much from his predecessors and contemporaries, Cole (1998) has suggested that Stein reinvented the piano. Mozart (aged around 22 years old) visited Stein’s workshop in 1778 and afterwards wrote enthusiastically to his father about what he had seen. Over the next few years, Mozart composed many piano solo and ensemble pieces, and it was his performances in the Austrian court along with those of his contemporaries during the 1780s that established the piano as a musical performance instrument (Cole, 1998).

In parallel, London also developed into an important center for piano performance and piano-making. Johann Christoph Zumpe (1735-1800), a cabinetmaker who had trained with
Gottfried Silbermann (1683-1753), immigrated to London in 1750 and initially, worked with Burkat Shudi (1702-1773), a harpsichord maker. Other instrument makers trained by Silbermann also immigrated to avoid the chaos of the Seven Years War (1756-1763). Queen Charlotte, wife of King George III, arrived in London in 1761 and brought with her J. C. Bach (1735-1782), a son of Johann Sebastian Bach and a composer and performer, and another instrument maker, Gabriel Buntebart. Johann Christian Bach and Buntebart became friends of Zumpe who then opened his own instrument-making workshop. Zumpe became a partner with Buntebart, making and selling small, square pianos. Johann Christian Bach composed for the piano and performed at court, demonstrating the piano’s performance potential, and court members recognized that a piano could enable music in their homes. Compared to a harpsichord, a Zumpe piano required less space, had a smoother sound, and cost less. Competitors made similar instruments and they sold well not only in London but also in Paris. In England, the piano was soon recognized as a musical performance instrument that enabled music in the home and by the early 1800s, English makers were also building an “upright” piano for homes. London became a center for piano making and piano performance (Cole, 1998; Wainwright, 1975).

By the early 1800s, performers were playing the piano in courts and in public concerts, families were using pianos to make music in homes, and the piano was recognized as a new category of musical performance instrument (Carroll and Wheaton, 2009). At one level, composers like Mozart and Beethoven composed works for piano performance. At another level, the emergence of smaller pianos made it possible to make music in homes. By the early 1800s, piano sales surpassed harpsichord sales, and performances in different locations to satisfy different audiences had led to a wide variety of shapes, sizes and performance types within the piano category – mostly square and upright pianos.
Piano Instrument Making, 1800-1853

At the beginning of the 19th century, Paris had joined London as an important center for piano making and it would soon be an important center for piano performance. Piano makers located in Paris included the firms founded by Sébastian Érard (1752-1831), Ignace Pleyel (1757-1831) and Jean-Henri Pape (1787-1875). Piano composers who lived in Paris included Pleyel, Frederic Chopin (1810-1849) and Franz Liszt (1811-1886). Virtuoso pianists who lived in Paris included Friedrich Kalkbrenner (1785-1849), Henri Herz (1803-1888), Marie Pleyel (1811-1875), Franz Liszt (1811-1886), Sigismond Thalberg (1812-1871), Anton Rubinstein (1829-1894) and Hans von Bulow (1830-1894). While piano makers were making changes to improve piano performance, additional requests emerged. Composers wanted pianos to have an extended range of notes, i.e., beyond the five octaves of a harpsichord.\(^4\) Introducing more notes increased the number of piano strings, and put more pressure on the piano’s wooden frame, increasing the risk of frame overload. Virtuoso pianists wanted louder pianos that could be heard more easily in concert halls. The concept of “the ideal piano was not yet fixed in the 1830s and … most pianists and piano makers were striving for qualities inspired by the playing of Franz Liszt and his followers: strong, powerful, poetic, passionate, virtuosic, sensitive, orchestral. Thus, modifications to the piano of the 1830s and 1840s were primarily attempts to obtain the Lisztian ideal…” (Hoover, 1981: 63). While piano makers could make pianos that generated a louder sound, they could do so only by increasing the weight and tension of the piano’s strings. The resulting increased pressure on the wooden frame made it likely to warp so that the piano went out of tune, or the frame and the piano might even collapse.

\(^4\) “By mid-nineteenth century, the repertory for piano included works by some of the leading composers: Mozart, Haydn, Beethoven, Chopin, Schumann, and Liszt. Especially with the last three, the repertory demanded a new piano technique: more singing qualities, refined pedal techniques, and bravura playing that sometimes required the piano to serve as an orchestra. The ideal piano at mid-century was the Erard grand-the piano…” (Hoover, 1981: 49).
As several of the Parisian piano makers were also well-known musicians, they recognized and discussed these and other issues associated with piano manufacture and performance. Ignace Pleyel, for example, was a composer and virtuoso pianist before opening his piano factory in 1807. His son Camille was a close friend of Chopin and managed the Pleyel factory with Friederich Kalkbrenner (1785-1849), also a virtuoso and composer. Sébastian Érard and his nephew, Pierre, worked to improve piano actions and Henri Herz (1803-1888), another virtuoso, simplified the action design. Pleyel and Érard both built public halls where piano virtuosi gave concerts. In comparison to the piano makers and performers who focused on performance issues, Pape focused more on technical inventions. Though the innovations made by different firms often improved the piano, most did not copy their rival’s ideas. Instead, they relied upon their own skills and insights to determine how they should improve the pianos they made (Good, 2001).

From the early 19th century on, piano technical developments, compositions for the piano, and virtuosi piano performance were centered in Europe – mainly London, Paris and Vienna – and they all developed rapidly. American piano makers usually followed Europe’s lead. An exception was the full iron frame developed by Alpheus Babcock (1785-1842) that better withstood the increased pressures caused by increasing the number of notes and the sound volume that composers and performers wanted. After Babcock became an employee of Jonas Chickering (1798-1853) in 1837, Chickering & Sons pianos began to use iron frames and the firm was soon recognized as the leading American piano maker. As in Europe, however, American piano makers tended not to copy improvements introduced by their rivals.

The performance improvements musicians wanted necessarily increased the pressures placed on piano frames. Makers responded by using heavier wooden frames and metal support braces. They were reluctant to introduce metal, however, because most were guild-trained cabinetmakers who believed not only that wood was the best material for making musical instruments but also that
a piano made with a metal frame would necessarily sound “metallic.” By the mid-19th century, the piano was well-accepted as a musical performance instrument and composers had written many virtuosi performance pieces for it, but even the best pianos could still warp out of tune disappointing audiences, composers and performers (Good, 2001; Hoover. 1981).

**Steinway & Sons: Historical Background**

Heinrich E. Steinweg, patriarch of the Steinway family, was born in 1797. In a disrupted early life that included fleeing Napoleon at the Battle of Austerlitz in 1806, and fighting him at Waterloo in 1815, Heinrich built and played several musical instruments. After military discharge he was too old to be an apprentice with a recognized master craftsmen or member of the cabinet-making guild, and so he learned cabinetmaking from an organ builder outside the guild’s jurisdiction who sped up the apprenticeship process. He married in 1825 and moved to Seesen, a village of 3,000 in Braunschweig. Initially, he had difficulty obtaining work but after a fire destroyed much of Seesen, the town’s chief justice, familiar with Steinweg’s work, invited him to open a workshop as a master cabinetmaker and help rebuild the town. In 1829, Heinrich bought a house with a workshop attached. He began building pianos there in 1835 and when his children visited, he had them specialize in learning to make the piano’s different component parts (Fostle, 1995; Lieberman, 1995).

Pianos were luxury items and a reputable craftsman earned much more making a piano than by doing other types of cabinetmaking. Initially, Steinweg copied the pianos owned by his friends. In Germany at the time, state trade fair competitions showcased the best local products. In 1839, Steinweg exhibited three pianos at the Braunschweig state fair where he won the piano competition and the Duke of Braunschweig bought his grand piano. This award and purchase established Steinweg as an expert local piano maker and so he abandoned cabinet making and became a specialist piano maker. Widespread famine in Germany in the 1840s and class tensions caused by e
use of troops to suppress revolts persuaded the Steinwegs to consider immigration. In 1849, their second son Karl came to New York to explore it as a possible place to settle. Heinrich, Sr., his wife and 7 of his children immigrated a year later. Heinrich, Sr. (53) and his sons Karl (21), Heinrich, Jr. (19) and Wilhelm (15) found work with piano making firms in New York (Fostle, 1995; Lieberman, 1995). In 1853, as workers in New York’s piano making industry threatened to strike, the Steinwegs resigned as employees, anglicized their names, and founded Steinway & Sons as a family partnership. In its first year, the firm made 12 pianos, in the next 49 pianos, and in 1855 it made 112 pianos and employed 55 people. In these first years, they sold only about a quarter of their production directly to the public. The rest was sold to Thomas H. Chambers, a stenciller, who put his name on the Steinway-made pianos, to a traveling salesperson who sold directly to upstate New York buyers, and to a teacher who sold them to pupils and acquaintances (Fostle, 1995; Lieberman, 1995).

Henry, Jr., in his early 20s led Steinway’s piano design efforts and his understanding had developed initially in his father’s workshop. His focus in New York was on ways to improve the “square” pianos that sold well and was used for making music in the home. He used a bricolage process (Garud and Kano, 2003) to turn available, local ideas into a design that would enable a stable piano with a louder sound. He noted, for example, how Chickering & Sons of Boston used an iron piano frame that largely eliminated the stability problems associated with more notes, heavier strings and higher string tensions. His square piano design incorporated an iron frame. He also drew on ideas from Frederick Mathushek (1814-1891), another immigrant who had worked with Pape in Paris. Mathushek explained how Pape’s overstrung designs enabled louder sound and cross-stringing made it easier to extend the note range. Henry, Jr., adopted these ideas and also Mathushek’s machine for covering hammers with felt. He also improved the actions and developed a new way to insert agraffes to improve treble sound quality (Crombie, 1995; Fostle, 1995).
The Steinways exhibited Henry, Jr.’s new design at the prestigious American Institute of the City of New York fair in 1855. Henry, Jr.’s entry was a square piano built on a heavy wooden frame and with an iron frame to hold the overstrung strings. The judges agreed that the Steinway entry was more stable and produced a more powerful sound. It was not only awarded first prize but news about its construction created a sensation in the American piano world. Steinway & Sons won many more fair awards enabling them to rapidly build a reputation for technical excellence (Dolge, 1911; Fostle, 1995). In addition to achieving recognition for the technical excellence of its pianos, the firm also sought user recognition by obtaining endorsements from New York’s thought leaders and musical elite. William Steinway still in his early 20s directed these marketing efforts. The arrangement was that New York’s socially prominent judges, politicians, churchmen, newspaper publishers and editors would receive a Steinway piano on loan and, in return, they wrote letters endorsing the quality of Steinway’s piano and services. Similarly, musicians received pianos on loan and wrote letters confirming their performance excellence.

With the success of Steinway pianos at technical fairs and a flood of endorsements from prominent New York citizens and musicians, sales of the Steinway square piano grew rapidly. In 1860, the firm opened a new manufacturing facility in Manhattan able to produce around 1,250 (mostly) square pianos. The plant relied on mass-production techniques to manufacture standardized piano parts, on craft skills to work with the wooden components, and on craftsmen to assemble, test and tune the pianos. The Steinway approach acknowledged the cabinet-making craft roots of piano making along with craft-based quality issues. It also sought where possible to reduce costs and increase production volume by using standardized parts and manufacturing machinery. Steinway & Sons grew from a start-up to being twice the size of its nearest rival in seven years (Fostle, 1995).
Steinway & Sons Seeks Recognition as the Maker of the ‘Best Grand Piano’

While initially Steinway & Sons had focused on selling square pianos for use in the home, the firm had also quickly gained recognition for the technical excellence of its pianos. Seeking to gain further recognition for their piano as a concert performance instrument, Henry Jr. designed and built several grand pianos. The Steinway concert grand piano sound was more powerful than that of the concert grand pianos like the Érard used by most European performers in the 1840-60s. The family knew that if their concert grand piano was to be globally recognized, its features had to be accepted and admired in Europe, the center of the musical world. In 1862, the Steinways and 132 other makers exhibited at the International Exhibition held at the Crystal Palace, London. One third of the exhibitors including Steinway & Sons received medals. Yet in their commentary, the judges ignored the Steinway’s introduction of a full iron frame saying: “[...] we have not to record the introduction of any very important novelty” (Fostle, 1995: 250).

In 1865, tragedy struck the Steinway family when Henry, Jr., the firm’s piano designer and Charles, the firm’s factory manager died. The family asked C. F. Theodore, the eldest son who had remained in Germany to join the family partnership in New York to manage its production and direct its research and development efforts. Theodore moved to New York and after reviewing the firm’s manufacturing operations, targeted the 1867 Paris Universal Exposition as the place to exhibit and gain European recognition for the technical excellence of Steinway pianos. During this time, William continued to manage sales and promotions. In 1866, he directed the building of the Steinway concert hall next to the Steinway showroom. It held 2,500 people and was the largest event venue in New York, establishing the firm’s prominence in the city’s cultural and institutional life.

The Paris fair was held in July 1867 and involved 178 exhibitors. Theodore arrived months in advance to give lectures to members of the piano juries and others describing the scientific principles that determined why a piano made a particular type of sound and, in particular, why
building the piano with an iron frame would not make it sound “metallic.” He also distributed brochures that described these principles and how the Steinway design took advantage of them. Theodore’s lectures were a revelation because use of a full iron frame was something European piano makers had always avoided. Theodore’s repeated arguments convinced the competition jurors that the Americans and the Steinways in particular, had a better way of building a piano that would enhance its performance. As the designs developed by Henry, Jr. drew on ideas developed by others, most were not patented and European manufacturers were free to copy the Steinway approach if they wanted to. Most German and Austrian manufacturers did so, implicitly endorsing the Steinway technology and the aesthetics of its sound but the leading English and French firms rejected change.

The Paris exposition awarded gold medals to Steinway & Sons and Chickering & Sons because both firms had used iron frame technologies. The awards given the leading London and Parisian piano makers, in contrast, identified them as second rank rather than as leading producers, and this was a sensational result. The newly acquired international recognition accorded American piano making aroused relatively little interest in the US. There, the main concern was about which of the two US firms – Steinway & Sons or Chickering & Sons – European judges thought was the best. This fueled a “piano war” between Steinway & Sons and Chickering & Sons in the US as each firm made claims and counterclaims concerning who made the best piano.

After the results of the Paris Exposition, European composers and virtuosi agreed to not only endorse but also play the Steinway piano in concerts. Anton Rubinstein (1829-1894) was Europe’s most successful concert pianist and William persuaded him to do a US tour starting and ending at Steinway Hall and including 200 variety concerts over an 8-month period in 1872.\(^5\) A

---

\(^5\) Steinway & Sons paid Rubinstein the then unheard-of rate per concert of 200 dollars payable in gold—Rubinstein distrusted both United States banks and United States paper money—plus all expenses paid. Rubinstein stayed in America 239 days, giving 215 concerts—sometimes two or three a day in as many cities. Rubinstein wrote of his American experience: “May Heaven preserve us from such slavery! Under these conditions there is no chance for art—one simply grows into an automaton, performing mechanical work; no dignity remains to the artist; he is lost... The receipts and the success were invariably gratifying, but it was all so tedious that I began to despise myself and my art. So
typical concert lasted around four hours with Rubinstein the star attraction. By the end of the tour, it
was clear that audiences wanted Rubinstein playing alone, and so the variety format was abandoned
and replaced by a solo concert format featuring a virtuoso pianist playing a Steinway grand piano. In
1892-1893, for example, Ignace Jan Paderewski (1860-1941) played 107 Steinway-sponsored solo
concerts in just 117 days, traveling through America with his own railroad car and a Steinway
concert grand piano. The solo concert by a virtuoso pianist became the model for Steinway-
sponsored concert tours that demonstrated the performance possibilities of a Steinway piano.

In 1872, Vienna hosted the next international exhibition for piano makers. With the aim of
avoiding new tensions due to decisions made by European judges, Steinway & Sons and Chickering
& Sons agreed neither would exhibit in Vienna. Theodore attended as a private citizen, however, and
visited the judges who he knew well. After the competition, the Steinways ran the following
advertisement signed by all 14 of the musical instrument jurors in Vienna: “We regret that the
celebrated inaugurators of the new system of piano-making, Messrs. Steinway & Sons, of New York,
who the entire art of piano-making is so greatly indebted, have not exhibited” (Fostle, 1995: 153). The advertisement implied that Steinway & Sons was the leading piano maker of the time.

During the second half of the nineteenth century, concert halls were becoming larger and
composers were writing works that required larger orchestras so that pianos that made still louder
sounds were needed. In fact, virtuosi and composers both wanted piano instruments for concert
performances to have still more power, stability, reliability and strength (Hoover, 1981: 50-51).
Despite having gained European recognition for Steinway’s pianos, Theodore embarked upon a
complete redesign of the Steinway grand piano to respond to these needs. He assumed that if the
piano strings could be stretched to their utmost, the piano would have the purest and most brilliant
tone and would generate the loudest sound possible. In designing his concert grand piano, Theodore

profound was my dissatisfaction that when several years later I was asked to repeat my American tour, I refused
sought to have the strings stretched to their utmost and he developed an iron frame powerful enough to ensure the piano could stand the resulting pressure and would remain stable. Through the 1870s, Theodore toured Europe discussing ideas with other piano makers and searching for materials to facilitate his new design. Dolge (1911) who knew Theodore, personally, described his approach:

“Step by step he invaded the fields of modern science, investigating and testing different kinds of wood in order to ascertain why one kind or another was best adapted for piano construction, then taking up the study of metallurgy, to find a proper alloy for casting iron plates which would stand the tremendous strain of 75,000 pounds of the new concert-grand piano that was already born in his mind, calling chemistry to his aid to establish the scientific basis for felts, glue, varnish oils, -- in short, nothing in the realm of science having any bearing on piano construction was overlooked” (1911: 303).

Reflecting these new ideas, Steinway & Sons and Theodore were awarded more than 40 US patents (Table 2). Of the fifteen patents “granted before the Centennial Exhibition in 1876, thirteen of them related to grands. The twenty-six patents granted between 1878 and 1885 included eleven for grands, eleven for uprights, and four that were either for both or were improvements in manufacturing techniques. From these statistics one can see Theodore’s absorption with the prevailing notion of big sound for which a strong, more stable case and frame structure was needed” (Hoover, 1981: 60).

An important invention was Theodore Steinway’s rim bending block – US patent No. 229,298 granted on June 22, 1880 – that is still used to make every new grand piano. In a unique Steinway-developed method, strips of wood were glued together creating a single continuous piece to bend into the shape of the rim. Before 1878 when Theodore Steinway developed and patented this method, rims were made of separate pieces of wood held together with joints. Theodore’s invention was also economical in that it permitted more cases to be made in a shorter time, with less loss of expensive dried wood. For an equally revolutionary piano design, Henry, Jr. had obtained an earlier patent – US patent 26,532 on December 20, 1859 – for the Overstrung Plate: the bass strings are “overstrung” above the treble strings of the piano to provide more length and better tonal quality.
This patent and all of the new patents associated with Theodore’s redesign constitute significant new investments in the company’s manufacturing processes and technical core.

**Competition with Industry Firms**

Given Steinway & Sons’ continuous claims of superior performance, premium prices and high profits, it was only a matter of time before “Steinway knock-offs” appeared. A piano components industry developed in the US in the 1860s and Joseph Hale, the “father of the commercial piano,” had contractors use factory assembly lines to make piano parts. He then had contracts with Albert Weber in New York to assemble the pianos, and with Charles P. Kimball in Chicago to sell them. His methods lowered costs and allowed middle class families to afford pianos. The quality of his instruments varied reflecting his assembly line approach and his emphasis on speed of production, but the pianos were sold at low prices and in vast quantities. Because Hale put names like Steinmay, Steinman and Steinmetz on his pianos, the Steinways despised him and all who worked with him. When Weber claimed his piano built on an assembly-line was the equal of a Steinway, William felt he had to confront him. The confrontation occurred at the Philadelphia Centennial Exhibition in 1876 with elite US firms like Steinway & Sons and Chickering & Sons on one side, and Hale, Weber and other firms involved in the mass-production of low-cost pianos on the other. The Steinway’s fear was that if the exhibition judges selected a mass-market producer for an award, this would raise questions about the superior value and premium prices of Steinway pianos. As all the exhibition judges had financial relationships with the exhibitors, everyone expected they would make judgments favoring the firms bribing them and the outcome the Steinways most feared would most likely occur. The document the exhibitors sought to influence was the judges’ report explaining which piano was the best and the press reported on many attempts to bribe the jurors writing this report. In fact, the jury issued a first report, then edited it, then offered a new set of explanations,
then recalled it to reconsider the arguments, and so on. Because of the repeated changes in the judges’ report, their verdict was gradually discounted enabling Steinway & Sons to retain its reputation as a producer of highest quality pianos with unique value worthy of a premium price (Hoover, 1976: 138-143; Fostle, 1995: 223-244).

The Next Generation at Steinway & Sons

With his redesign of the Steinway “D” concert grand completed to widespread acclaim in the 1880s, Theodore Steinway retired to Germany. By this time, Steinway pianos had a worldwide reputation for technical excellence and concert artists and composers were essentially unanimous that the Steinway “D” concert grand was the leading piano performance instrument. The firm operated showrooms in London and New York and dealerships in many other European and US cities and it served concert pianists on both sides of the Atlantic. In 1880, Steinway & Sons also opened a manufacturing facility in Hamburg to compete with firms like Bechstein, Bluthner and Ibach that had copied the Steinway approach and threatened to dominate high-end, European piano sales (Crombie, 1995; Fostle, 1995).

William Steinway was not only chief executive of Steinway & Sons but due to his wide involvement in civic affairs he was also a member of New York’s power elite. To celebrate America’s quadric-centennial in 1893, for example, he chaired a committee that proposed New York as a US site for a World’s Fair. When the US Congress then chose a Chicago site, William nevertheless donated $25,000 to aid the Chicago fair. When he learned that a single judge commercially affiliated with Charles P. Kendall would adjudicate the piano competition, he along with other East Coast firms announced they would boycott the fair. At the time, however, the Polish virtuoso Ignace Jan Paderewsky (1860-1941) was in the midst of a highly successful US concert tour sponsored by Steinway & Sons. The Chicago Fair organizers invited Paderewsky to inaugurate their
exhibition and to punish the boycotting firms, asked him to play a piano entered in the competition. Paderewsky said that while he would like to play in Chicago, he could only play on a piano he was used to. The organizers eventually relented and Paderewsky played a Steinway. Extensive reviews and editorial comments complemented Steinway & Sons and criticized the fair. As in Vienna in a competition they did not enter, Steinway & Sons received the recognition due a winner (Fostle, 1995).

Besides Steinway & Sons, William had many other interests. With the aim of putting distance between Steinway & Sons and the labor unrest associated with New York City, he bought land in Queens on which to build a new Steinway factory. He used land surrounding the factory to build a company town for employees that included a school, a library, a church and an amusement park. As his factory was located in Queens but he lived in Manhattan, William was personally concerned about transportation between Manhattan and Queens. He invested in ferries, streetcars, tunnels, powerboats and motorcars, the latter a joint venture with Gottlieb Daimler to develop motor transport vehicles suitable for making the trip. He was also chairman of the Steinway Commission that planned the NYC subway system.

William died in 1896 and due to his many investments in transportation ventures, audits showed that he and Steinway & Sons were financially overextended. William’s nephews, Charles and Fred Steinway, became the new top management and despite the firm’s technological dominance and reputation in the piano field, its many debts made it unclear whether the firm could survive. Charles visited London hoping to sell Steinway & Sons as a going concern but the London bankers were also pessimistic and would not make a deal. The nephews returned to New York and focused on reestablishing the solvency of Steinway & Sons by increasing sales and profits. They liquidated William’s other investments and focused on pianos, expanding the product line to include smaller grand pianos that could fit more easily into wealthy homes.
In 1900, Steinway & Sons hired the advertising agency, N. W. Ayer & Son to promote the firm and its piano sales. The agency pointed out that as well as an interest in music, buyers of Steinway pianos also placed high value on the status associated with the Steinway name (Roell, 1989). In 1912, Charles Steinway, observed:

“It was without doubt the most effective of all advertising methods we employed, since it not only made the piano and its maker widely known, but assisted in laying the foundation for a broad national culture” [quoted in Lieberman, 1995: 17].

The scripts used to promote Steinway pianos signaled the desired associations. One did not “buy” but “invested” in a Steinway. There was no such thing as a better Steinway, only a Steinway that was the best. It was more important to own rather than to actually play a Steinway piano. A Steinway piano was always made a little bit better than was necessary. The Steinway piano established a center around which a family gathered. The advertising copy also mentioned the contributions Steinway & Sons had made to the musical world and the awards it had received for the technical excellence of its pianos. Advertising expenditures emphasizing such themes grew to 10% of the price of each piano sold. By the 1920s and thanks to this continuous advertising, US consumers knew a Steinway piano made the best sound and symbolized high status and class. Advertisements in The Music Trades review – a leading music industry publication – emphasized Steinway & Sons’ unique craftsmanship (Table 3). As Carroll and Wheaton (2009: 260) point out, with products “associated with personal taste and lifestyle, the status conferred is more general than that of expert: it accords an overall image of sophistication and refinement. Consumers may seek obscure specialty products particularly because they are believed to possess unusual but attractive qualities; however, the fact that they potentially generate status for knowledgeable consumers may also constitute a large part of their appeal.” This happened as Steinway pianos were recognized as the best performance instruments. The firm commissioned paintings of performers and composers, past and present, implying “timeless” excellence, and it made many claims to the effect that the Steinway piano was a critical
element in many artistic creations (Roell, 1989). Consistently, the firm constructed imagery that linked the Steinway piano to high status and artistic culture.

In the 1890s, however, all US piano makers faced severely depressed sales. Several merged to form two firms – the Aeloian Trust and the American Piano Company – to compete against Steinway & Sons. These firms focused on the home market to reestablish their financial strength, conceding the “art” market for concert performance piano instruments to Steinway & Sons. The industry was further transformed when mechanical “player” pianos appeared to provide music in the home. While 2,000 player pianos were sold in 1905, 100,000 were sold in 1910 and the US piano industry expanded to around 250 firms. Steinway’s management saw the potential profits in “player” pianos but also realized that mass-market participation was inconsistent with the authenticity they were nurturing through involvement in elite piano performance markets. Given their stressed financial condition, Steinway & Sons agreed to supply the Aeolian Trust with uprights ready to be fitted with player mechanisms. The Aeolian Trust placed the player mechanism in the piano and named it the “Steinway Pianola” that was sold by Aeolian but not Steinway dealers.

The agreement also required the Aeolian Trust to give up the promotion of concert tours by virtuoso pianists. Specifically:

“The clause in the agreement above mentioned to the effect that the Aeolian Co. Ltd. ‘will exploit the Weber pianos in public only through such minor pianists as Steinway & Sons may permit’ shall be adhered to, but Messrs. Steinway & Sons agree in the cases of first-class artists who are not playing Steinway pianos, or with whom Messrs. Steinway & Sons are not negotiating for that purpose, to consider any application from the Aeolian Co. Ltd. for permission for such artist to play the Weber piano, and Messrs. Steinway further agree that their consent shall not in such case be unreasonably withheld” (Meeting of the Board of Directors of the Corporation of Steinway & Sons, held at its office, 107 East 14th Street, in the City of New York, on Tuesday, October 10, 1922, at 2:15 P.M.).

As the Aeolian Trust had no interest in underwriting virtuoso concert tours, they agreed. For Steinway & Sons, however, sponsored concert tours by virtuoso pianists had become a part of their technical core forming a controlled link between Steinway pianos and virtuoso piano performance.
Steinway & Sons wanted this link uncontested: an uninterrupted link to performance excellence that was attainable only through playing a Steinway piano and the Aeolian agreement legally ensured this with an important competitor.

In 1905, Steinway & Sons started its Steinway Artists program that was designed to include the best virtuosi and to have them agree to play and endorse the Steinway D grand piano. Also in 1905, Steinway began to associate its name in advertising with well-known virtuoso pianists. Jan Paderewski was the feature of the first advertisement in that series (Figure 1): “My joy in the grandeur, the power and the ideal beauty of the tone and perfect mechanism of the Steinway is unbounded” (Robert Alden, *The New York Times*, November 8, 1960). Steinway & Sons also greatly increased the number of its sponsored virtuoso concert tours and its roster of supported virtuoso concert pianists grew to around 600 – essentially all of them. To be recognized as a concert pianist, a virtuoso almost had to play a Steinway piano. With endorsements from almost all of the virtuoso pianists of the time, the Steinway piano was recognized as the best piano by the most demanding of users. In 1920, the firm adopted the slogan “*The Instrument of the Immortals.*”

As competitors focused attention on home markets and competition disappeared in the virtuoso performance market, Steinway & Sons advertising repeatedly reiterated the technical superiority and authenticity of its pianos for virtuoso performance. The wording of firm advertisements claimed not only that the Steinway was the best piano, but also that its presence was something taken-for-granted by the best virtuoso performers. More broadly, however, by owning a Steinway, citizens gained membership into a highly distinguished order with high status that emphasized the highest of artistic ideals (Fostle, 1995; Roell, 1989).

---

6 Some of the ads calling the Steinway piano “The Instrument of the Immortals” claimed that virtually every great musician since Liszt had preferred the Steinway: “The very progress of their careers was founded in large degree upon its exquisite sensitiveness to the exacting demands of genius, and upon its glorious and unfailing richness of tone. In the world’s homes of refinement, as well as on the concert state with genius, the Steinway remains the beautifully appropriate instrument. A living work of art, it radiates an aura of cultured romance and traditional distinction” (*The Music Trades*, April 1933, Vol. 81 No. 4, p. 9).
Authenticity Challenges to Steinway & Sons - 1920s-1950s

Steinway & Sons was faced with four major external challenges from the 1920s until the end of WWII: the introduction of radio, the Great Depression, World War II and the introduction of television (Fostle, 1995). When radio broadcasts began in 1920, US unit sales of ‘player’ pianos declined from a peak of nearly 200,000 in 1923 to only 2,100 units in 1927 and hundreds of piano firms closed. Yet despite these dramatic drops in home market sales, the upscale sales of Steinway & Sons rose until 1926 to an all-time peak of 6,294 grand pianos and the firm continued to invest in expensive sales promotion campaigns and to give the Steinway concert artists generous support.\(^7\) In 1930, however, demand for Steinway & Sons’ grand pianos plummeted to 2,379 and profits dropped (Table 4). Traditionally and to buffer its technical core, Steinway & Sons had made its grand pianos according to schedule rather than based on individual orders, operating as if the market could absorb its pianos at a continuous rate (Thompson, 1967). As the accumulated stock of finished pianos grew, piano production was slowed and actually stopped at the end of 1931 when hundreds of workers were laid off. The firm kept fifty or so skilled foremen who slowly completed the work in process and built the occasional special order.\(^8\) In the President’s Report for 1931, Theodore E. Steinway described the situation:

“It is hardly worthwhile to quote the usual statistics as to number of units manufactured during the year as we found our accumulated stock of finished goods so large that we ceased work in our factories toward the end of the year. Our stock is gradually being sold, however, and we hope that by September or August of this year, we will gradually take up production in our factories once more.”

In order to cut its financial losses ($265,000 in 1930 and $604,500 in 1931), Steinway & Sons also decided to slash concert promotions and artist expenses. For example, the practice of paying one

---

\(^7\) “By 1929 advertising expenses reached almost $107 per piano, more than 10 percent of the average selling price” (Fostle, 1995: 462).

\(^8\) “The remaining factory men had wages cut by about 30 percent; the clerks’ salaries were reduced by 40 percent. The biggest reductions were reserved for department heads and executives. These salaries were slashed by two-thirds, and bonuses became a thing of the past. Executive salaries were set, in Theodore E.’s words, ‘to a 1901 basis.’ The President of Steinway & Sons now drove a Dodge” (Fostle, 1995: 464).
hundred dollars per concert to a Steinway artist was eliminated. While the company still paid for a
tuner, the virtuoso had to pay for the transport of the piano. As Cyert and March (1963: 43) noted,
when “the environment becomes less favorable, organizational slack represents a cushion. Resource
scarcity brings on renewed bargaining and tends to cut heavily into the excess payments introduced
during plush times... the cushion provided by organizational slack permits firms to survive in the
face of adversity.” The Board of Directors Minutes further explains that the payments Steinway &
Sons had previously paid to renowned pianists such as Paderewski, Hofmann, Rachmaninoff and
others were to be cut. Yet the reaction of some of the virtuosi is also interesting, for it indicates an
additional source of organizational slack for a firm developing an authentic product:

“Mr. Theodore E. Steinway further reported that Mr. Ignace Jan Paderewski had generously
and graciously refused to accept his subsidy of eight thousand dollars due him for the season
1930-1931 from Steinway & Sons on account of the present depressed state of business”
(Meeting of the Board of Trustees of the Corporation of Steinway & Sons, held at its office,
109 West 57th Street, in the City of New York, on Monday, June 8, 1931, at 2:30 P.M.).

The need to cut costs is confirmed in several Board meetings between June and August 1931:

“… in view of the poor business conditions and in order to conserve cash it was resolved that
no dividend be declared at this time. The secretary was instructed to notify all shareholders to
this effect” (Meeting of the Board of Trustees of the Corporation of Steinway & Sons, held at
its office, 109 West 57th Street, in the City of New York, on Monday, June 8, 1931, at 2:30
P.M.).

“… it was resolved that a universal cut of five per cent be made in all salaries and wages of
foremen beginning with July 1, 1931” (Meeting of the Board of Trustees of the Corporation
of Steinway & Sons, held at its office, 109 West 57th Street, in the City of New York, on
Wednesday, June 10, 1931, at 2:30 P.M.).

“Mr. Theodore E. Steinway submitted a schedule for reducing expenses in the Concert &
Artist Department Service, as suggested by Mr. Greiner ... A copy of Mr. Greiner's expense
reduction schedule was ordered spread upon these minutes and is attached hereto” (Meeting
of the Board of Trustees of the Corporation of Steinway & Sons, held at its office, 109 West
57th Street, in the City of New York, on Thursday, August 27, 1931, at 11 A.M.).
To rekindle sales of keyboard instruments, Steinway & Sons also considered reducing their prices:

“After a lengthy discussion on the subject of price reduction, upon motion duly made, seconded and carried, it was resolved to reduce our prices, both wholesale and retail, approximately 15%, effective as of November 1, 1931” (Meeting of the Board of Trustees of the Corporation of Steinway & Sons, held at its office, 109 West 57th Street, in the City of New York, on Wednesday, October 14, 1931, at 10 A.M.).

Steinway & Sons also lifted some restrictions imposed on Steinway artists concerning the use of non-Steinway pianos. Artur Schnabel (1882-1951), for instance, had complained that Steinway “refused to let me use their pianos unless I would give up playing the Bechstein piano – which I had used for so many years – in Europe. They insisted that I play on Steinway exclusively, everywhere in the world, otherwise they would not give me their pianos in the United States. That is the reason why from 1923 until 1930 I did not return to America” (from My Life and Music, reprinted in 1988: 84). In 1933, however, Steinway agreed that Schnabel could use its pianos in the US and play a Bechstein elsewhere and so from 1933 on, Schnabel came every year to give concerts in America.

Because of the continued depression and new losses in 1931 (Table 4), the President's Report concluded:

“General conditions here have not improved in 1931. Conditions in Germany were economically and politically bad also, but in England there were distinct signs of a slow improvement which we hope will continue throughout 1932. Here this year, 1932 began in a more hopeful manner than last year. We find no lack of interest in music and pianos. We have a great many prospects but the lack of purchasing power due to the times is the determining factor in business today. We look forward with some degree of hope, however, to an improvement in conditions from now on.”

Given its accumulated, large stock of finished but unsold pianos in late 1931, Steinway & Sons decided to stop factory work and then reopened twenty months later in August, 1933. Compared to the 1920s, the 1930s, and early 1940s had much lower sales leading to erratic production patterns and declines in the number of grand pianos made. While in 1926, the peak year, Steinway & Sons
shipped 6,081 grand pianos, it shipped only 2,379 in 1930 and 888 in 1932. In 1936, they sold 3,620 grand pianos but then sales dropped to a record low of 248 in 1943. New activity producing income was needed and at a 1941 Board of Directors meeting, Paul H. Bilhuber spoke of war work:

Bilhuber “… spoke at some length regarding the rumors of a possible curtailment of production to come and requested permission of the Board to judicially investigate the possibilities of war work for the factories through our contract. The Board agreed with Mr. Bilhuber as to the advisability of this move and authorized him to thoroughly investigate all war work possibilities through our various contacts” (Minutes of the Regular Monthly Meeting of the Directors of Steinway & Sons held at its offices at 109 West 57th Street, New York City, at 10 A.M. August 20, 1941).

The War Production Board declared piano manufacture to be “nonessential” in Spring 1942 making further piano production forbidden. Henry Z. Steinway recalled, “We were desperately looking around for something to do. … And one day a procurement guy from the army says there’s an outfit that has a contract to make a glider but has no place, no staff, no nothing. So we got together with the company, which was called General Aviation… and we rented them a factory and took the contract to manufacture all the woodwork going into gliders, which was practically everything: the wings, the tail surface, there was a complicated floor, and the nose where the pilot and co-pilot sat” (Personal interview with one of the authors). The wood for the gliders had to be bent to form different shapes and Henry said that was something Steinway & Sons “knew how to do” based on the firm’s skill in building grand pianos. In 1943, Steinway & Sons also obtained a contract approved by the War Production Board to build “Victory upright pianos.” Around 3,000 Victory Pianos were made for military entertainers to give troop concerts, enabling Steinway & Sons to restart making pianos before the end of the war (Stahura, 2003: 45-48).

After the war, while Steinway & Sons still had its name and associations with high culture, its piano-making capacities had been essentially on hold for 15 years and they had atrophied. The context of the piano industry had also changed as televisions were now the home center around which families gathered. Henry Z. Steinway, a fourth generation family member had joined Steinway
& Sons in 1937 as an apprentice, and he became vice president in charge of factories in 1946, and president in 1955. He took on the task of rebuilding Steinway & Sons and this required him to reestablish Steinway & Sons manufacturing capabilities. In 1995, Henry Z. Steinway explained:

“I did this by absolutely insisting that no changes were to be made in any of the traditional methods of making a Steinway piano. I was dependent on the older foremen who were still around to ensure this” (Personal interview with one of the authors).

He noted further how traditionally, Steinway & Sons’ knowledge about how to build a piano had been handed down from Theodore to the foremen, and then from one generation of foremen to the next as craft knowledge. As in the 1940s, this knowledge had never actually been written down, it was tacit and to the extent that this procedural knowledge existed after WWII, it was resident in the work force foremen that had been essentially disbanded 15 years earlier. Steinway explained that he and the firm were dependent on finding and working with former foremen who could remember and explain Theodore’s old processes. The firm’s manufacturing process was reestablished only because many former employees could be easily contacted because they still lived close by the factory in the Steinway area of Queens that had been developed as a company town. In contrast to earlier times when strife had characterized the relations between Steinway management and its employees, a strong sense of mutual interdependence between management and union workers characterized the reestablished manufacturing organization. With the help of its foremen and supervisors, Steinway & Sons re-identified and implemented its procedures for building pianos. After this was accomplished, and for the first time and to the extent it was possible, Steinway & Sons also documented the firm’s techniques, tools and routine processes for making pianos.

---

9 The Federal Government passed the National Labor Relations Act in July 1935, which de facto sanctioned the end of the old principle that labor-management relations were largely a matter between employers and employees. The new law “not only interposed a role for government, but it set up procedures under which collective bargaining would occur and created a quasi-judicial agency, the National Labor Relations Board, to enforce regulations” (Fostle, 1995: 474). One result was a major increase in the number of unionized workers.
Steinway’s Response to Authenticity Challenges

We have argued that authenticity claims work best when they are organizationally constructed (Carroll and Wheaton, 2009), namely when the social construction is visibly supported and embodied in the organization’s formal structures and operations. A focus on Steinway & Sons’ organizing structure and operational approach provides an understanding for how it maintained its authenticity as it navigated the 1930’s depression and WWII. Throughout this period, Steinway & Sons continued to innovate, for example, to further enhance the quality of its instrument performance as is indicated by its patents from the period (Table 7); retained key employees such as foremen and supervisors who were critical repositories of tacit knowledge; and continued to maintain its relationships with virtuoso pianists and concert halls, even as it took other steps to reduce its costs.

Continuing efforts to improve piano performance have always characterized Steinway’s history, including the period after William Steinway’s death in the 1890s when the firm was overextended, and during the depression and WWII periods when due to a lack of sales, the company struggled to stay in business. During both periods, innovation continued with two inventors – both family members – playing key roles: Frederick A. Vietor and Paul H. Bilhuber. Frederick A. Vietor, the son of Adolf Vietor and Henrietta Steinway Vietor, eventually became a director, vice-president and general manager in 1930. During his career, Mr. Vietor became friends with musicians and virtuosi pianists such as Rachmaninoff, Paderewski and Hofmann, all of whom publicly praised Steinway’s pianos for their unique qualities.10 Tables 8 and 9 reproduce letters Hofmann and Vietor exchanged in July 1932 where, amongst other things, Hofmann emphasizes

10 Similarly, when Rachmaninoff was selecting a grand concert piano for his 1923 American tour at Steinway Hall (New York), he turned to Mr. Steinway and said: “How can I know which one of your pianos I like best when you make them all so perfect!” (in The Music Trades, June 9, 1923).
how Steinway pianos sound better than other pianos. Such interactions with virtuosi pianists provided inputs and suggestions for designing and making pianos, continuing to improve and expand the firm’s technical core. In this sense, Steinway & Sons had a coopting strategy for absorbing virtuosi pianists’ recommendations as a “means of averting threats to its stability or existence” (Thompson, 1967: 35). Cooptation increased the certainty of future support by key users, especially leading performers.

Several Steinway family members were prolific inventors and their ideas were often incorporated into new Steinway models. Though less prolific than some of his predecessors such as Henry Ziegler and C. F. Theodore, Victor obtained two patents for accelerated piano actions (Table 2) – i.e., patent 1,826,848 “Piano Key Mounting for Accelerated Action” filed on Feb. 18, 1931 and granted on Oct 13, 1931; and patent 2,031,748 “Piano Keyboard Balance Key Rail Pin for Accelerated Action” filed May 18, 1934 and granted on February 25, 1936 – the essence of which “is still used in some American Steinways” (Fostle, 1995: 468).

The other key inventor in this period was Paul H. Bilhuber who was factory manager and worked on Steinway technical department for years before being elected vice-president in 1941 (The Music Trade Review, September 1941, p. 10). One of his patents – “The Diaphragmatic Soundboard” filed on August 18, 1936 and granted on February 9, 1937 (Table 10) – was a breakthrough invention and is still used in Steinway pianos. Despite facing contingencies that could have weakened or threatened its technical core, through the efforts of inventors who were often family

---

11 In his book, “Piano Playing with Questions Answered” (1914/1976), Josef Hofmann explains his views on technique and musicianship. Hoffmann had small, exceptionally strong hands and eventually, Steinway & Sons built a piano with a customized keyboard for him that featured slightly narrower keys than are found on a regular Steinway piano.

12 Henry Ziegler 1857-1930) was the son of Doretta Steinway Ziegler (1827-1900) and Jacob Ziegler (1825-1897), and the nephew of William Steinway.

13 The soundboard has a curved crown to provide the proper pressure against the string for maximum sound projection. Ribs are placed on the underside of the soundboard in order to maintain the crown, distribute tone along the soundboard, and provide strength. The soundboards found in Steinway pianos are double-crowned and feature Steinway’s Diaphragmatic design. The Diaphragmatic Soundboard features a soundboard that tapers in thickness from the center to the edges. This design permits freedom of movement and creates a richer, more lasting tonal response.
members and interested in improving the piano, Steinway & Sons has consistently through the years preserved, expanded and improved its technical core. Indeed, Steinway & Sons’ generations of master craftsmen confirm how the accumulation, retention and transfer of unique in-house craft-based knowledge was leveraged across succeeding generations of piano instrument makers (Argote, McEvily, and Reagans, 2003; Garud and Nayyar, 1994; Lenehan, 1982).

How could Steinway & Sons preserve its craft-based knowledge despite disruptive events that entailed prolonged interruptions to its core operations and revert back to its established routines and standards for piano-making? Over the years, Steinway & Sons relied on an apprenticeship system to teach piano making and so tacit knowledge was passed from masters to apprentices within Steinway’s manufacturing plants without codifying or retaining the knowledge in a written format. During the Great Depression and WWII years, Steinway & Sons tried to keep its most experienced and most able foremen even as it laid off hundreds of other workers. It was the lack of work in this period that placed the tacit knowledge that had been accumulated over the years at risk of loss.

It was also customary for Steinway family members – including those who eventually held top management positions – to start work as apprentices so they would be acquainted with all aspects of piano construction. Before becoming president, Theodore E. Steinway had accumulated “an unusually sound scientific knowledge of piano construction” (The Music Trades, July 30, 1927). This holistic piano-making knowledge also explains why at Steinway & Sons, it was always a single person who directed the piano design effort. This holistic knowledge proved especially important during the Great Depression and WWII. When piano production plummeted to record low levels and stopped from about the end of 1931 till August 1933, only a few foremen were left to complete the work in process and build the occasional special order. As the foremen, together, had direct experience with most phases of piano making and also possessed the same holistic knowledge, the risk of losing the tacit craft knowledge for piano making was reduced. Similarly, the decision to
obtain war work and concentrate on producing wooden components (e.g., wings) for gliders and caskets from 1943 to 1945 – an illustration of what Thompson (1967: 35) called a contracting strategy (i.e., negotiating an agreement for future performance exchange) – not only helped the firm survive but also enabled it to retain most of its most skilled workers despite massive lay-offs. On both occasions Steinway & Sons sought to shield and protect its technical core, keeping intact its ability to produce ‘true-to-craft’ pianos if and when normal conditions returned.

Steinway & Sons has also understood the value of knowledge gained through use, e.g., by virtuosi performers who know better than the craftsmen making the piano what the performance needs in particular concert halls and for performing particular compositions are for piano instruments. Emblematic is the role played by Josef Hofmann who besides being one of the greatest virtuosi of his generation was also an inventor with over 70 patents to his credit. Of particular interest is his invention of piano action improvements (US patent number 2,263,088 filed on October 14, 1940 and issued on November 18, 1941) that Steinway & Sons adopted (Ratcliffe and Isacoff, 2002). Besides convincingly endorsing Steinway pianos and confirming their authenticity – Steinway artists have been sources of performance feedback and suggestions that have helped the company retain its true-to-craft authenticity.

The credibility of Steinway and Sons’ authenticity claims were also reinforced by the firm being a family business in which some family members have remained actively involved. The pattern established by Charles and Henry Steinway Jr. in the 1850-60’s, and continued by William and Theodore in the 1860s-80s also continued in succeeding generations. Specifically, administrative control of Steinway & Sons has regularly passed to a pair of male family members active in the day-to-day operations of the firm, with one an “inside man” – a builder with a holistic understanding of the craftsmanship involved in piano making – and the other a financier, promoter, or salesman. For instance, in the last generation of the firm under family control, Henry Z. Steinway was the president
and factory man, while his younger brother John concentrated on marketing and promotion – a third brother, Theodore, who retired in 1979, was an engineer (Lenehan, 1982). Audiences “regard independent organizations, and especially family-owned businesses as more authentic than others” because they are “able to identify more easily the social values and associated actions of independent and family-owned organizations than those belonging to a chain” (Kovács et al., 2013: 5). The direct involvement of the Steinway family and their beliefs as demonstrated, for example, by Henry Z. Steinway, ensured consistency in the techniques, tools and processes supporting the company's technical core and, by implication, he credibility of its authenticity claims.

DISCUSSION

The case study shows how authenticity is not just socially constructed but it is also grounded in specific organizational features – the organization’s technical core – that are maintained, evolve and are extended over time in ways that audiences recognize. To enhance recognition, organizations differentiate their offers (Zuckerman, 1999). This need for differentiation explains why in the long run, craft authenticity – with its emphasis on skills and craftsmanship – moves to center stage as audiences evaluate competing offers. Focusing on craft authenticity also entails recognizing how organizations protect their technical core in the face of external and internal contingencies. Building upon Thompson’s (1967) organization design components (input, technical core, and output activities), the case analysis shows how Steinway & Sons has consistently developed and extended its technical core in ways that in the eyes of external audiences ensure its ability to make true-to-craft pianos. To this end, an integral part of Steinway & Sons’ strategy was the absorption of critical elements of its task environment – particularly virtuosi piano performers – to reduce both external and internal contingencies that could threaten the viability of its technical core. The Concert and Artist Department, for instance, has played a critical role attracting and keeping long-term exclusive
relationships with most virtuoso pianists. Steinway & Sons cemented these relationships by adjusting its pianos to cater to virtuoso pianists’ needs and playing style. Unlike other manufacturers such as Yamaha and Kawai that have tried to make all grand pianos of equal quality, each Steinway grand is essentially unique: a grand that appeals to one virtuoso pianist may not appeal to another. This uniqueness – which is the result of consistently applying true to the craft techniques, tools and processes – explains Steinway & Sons’ ability to achieve recognition and prestige among leading performers and, by implication, acquire power relative to them (Thompson, 1967: 33). Focusing on how an organization builds, maintains and adjusts its technical core to produce true-to-craft products and services opens up the opportunity to examine the specific strategic decisions and actions an organization takes to shape audiences’ perceptions that its products or services are truly authentic, namely produced according to true-to-craft techniques, tools and processes.

A longitudinal case study enables us to trace out how the credibility of an organization’s authenticity claims are not only built up but then also maintained over time. Exogenous changes may challenge an organization’s technical core and, by implication, the credibility of its authenticity claims. The case analysis reveals how authenticity becomes a pressing matter and also an important asset as an organization is under threat (Carroll and Wheaton, 2009). There were periods (e.g., the Great Depression and WWII) when Steinway & Sons’ ability to make true-to-craft pianos was reduced. During these periods, the firm preserved craft authenticity by shielding the technical core from external influences. The efforts of Steinway & Sons to keep its (mostly tacit) craft knowledge base intact have proven critical for remaining the leading authentic piano maker till today.

---

14 In North America, Steinway & Sons also maintains an inventory of 300 pianos for concert performances from the company’s unique “piano bank.” The Steinway Concert Service maintained banks of pianos in cities across the US for use by Steinway-approved artists. Once a performer achieves sufficient stature to be considered eligible, s/he is offered the opportunity to use a Steinway for all performances – the only expense being the cost of hauling the piano to the recital hall. A performer could visit dealers in any of the cities involved, try out the concert grands there available, and request that a particular piano be made available on a particular date. Steinway would then handle the logistics. The concert bank led to long-standing relationships between performers and particular pianos. Each Steinway dealer maintains the instruments to Steinway concert standards at all times (http://www.steinwaypianos.com/service/concert).
Steinway & Sons faced such a problem, again, when it was sold to CBS in 1972 (Table 11). CBS made needed investments in updating manufacturing equipment but in its quest for economies leading to profits, production was made more standardized. Steinway & Sons also contracted with other firms (e.g., Kawai, Young Chang) to make cheaper Steinway-designed pianos to be sold in Steinway stores in order to increase dealers’ sales and, in turn, its own sales as a CBS subsidiary. As Steinway & Sons seemed more focused on increasing sales and reducing costs, competitors wondered if Steinway was doing things that would change it from being a competitor emphasizing authenticity as it had been, and the press questioned whether a new Steinway was, in fact, as good as an old one. Yamaha, for example, challenged Steinway’s exclusive links to virtuoso pianists by signing André Watts as a Yamaha rather than a Steinway artist, giving the signing much publicity. Starting in 1968 virtuoso pianist Sviatoslav Richter also claimed to prefer a Yamaha grand piano to other grand pianos.\footnote{In an effort to catch up with Steinway & Sons, Yamaha has published claims attributed, not always accurately, to Steinway artists such as Rudolf Serkin, Andor Foldes, Arthur Rubinstein, Wilhelm Kempff, and others. According to a Yamaha press release (Japan Music Trades, January 1968), for example, Wilhelm Kempff, “performed a concert program on the new CF and made a 10-minute voluntary speech, quite off the ceremony schedule, and acclaimed the piano as the ‘The world’s first-class concert grand.’ Kempff professed astonishment when he read this report. He insisted that on a tour of Japan he ‘found magnificent Steinway grands at all points. It was only at one lecture for students which was totally unadvertised that he had to play the Yamaha which was on hand.’ Yamaha derived the endorsement from statements he made at the lecture” (Lieberman, 1995: 294-295).} Similarly, many distinguished musicians chose to compose (e.g., Igor Stravinsky, Béla Bartók, Leonard Bernstein and John Williams), perform (e.g., Walter Gieseking, Claudio Arrau, Jorge Bolet, Earl Wild) and record using Baldwin pianos. As critics and competitors noticed that CBS was managing Steinway & Sons using primarily financial assessment criteria, doubts about Steinway’s authenticity claims grew. In 1985, a group of new investors led by the brothers John P. and Robert M. Birmingham bought Steinway & Sons and immediately reintroduced a more craft-like production system (Gilpin, 1995). Today, Steinway & Sons claims that the quality
of its pianos has not only been reestablished but also improved. The firm’s advertising programs continue to emphasize the Steinway piano as a cultural icon, the list of Steinway artists still includes almost every major artist who uses the piano as a performance instrument in the world, and 98% of the world’s concert halls still feature a Steinway piano.

Studying how Steinway & Sons was able to preserve its authenticity claims despite facing adversity has shed light the organizational conditions supporting the credibility of those claims. The credibility of craft authenticity claims is embedded in the organization’s techniques, tools and processes that enable its products or services to be perceived as genuine and real. As the knowledge underlying these techniques, tools and processes is largely tacit, the question is how they can be preserved when production stops (e.g., at Steinway & Sons during the Great Depression). Previous empirical studies have demonstrated that knowledge does not accumulate and persist indefinitely through time (e.g., Dutton and Thomas, 1984; Yelle, 1979). Argote, Beckman and Epple (1990) and Argote and Epple (1990) found that knowledge tends to depreciate in a variety of settings (e.g., shipyards, truck assembling, fast food franchises), irrespective of the complexity of the underlying knowledge base, and that recent experience doing a task is a better predictor of current productivity than past experience. Indeed, knowledge depreciation occurs even after a relatively short interruption. For instance, when production “was resumed after an interruption at a manufacturing firm such as a strike, unit cost was higher than the level achieved before the interruption” (Argote, 1999: 36).

Depreciation also increases when knowledge is embedded not in a technology but in individuals, and so particularly in the face of employee turnover as individuals are important

---

16 In 1995, Steinway Musical Properties, the parent company of Steinway, merged with the Selmer Company to form Steinway Musical Instruments where the Korean Samick Music Corporation is the largest shareholder.

17 “The conventional measure of knowledge, cumulative output, implies that there is no forgetting or depreciation: knowledge obtained from a unit of output produced in the distant past is as useful as knowledge obtained from a unit produced yesterday” (Argote, 1999: 37).
repositories of tacit knowledge that is often not codified or available in a written format (Polanyi, 1962; Winter, 1987). Such turnover can hinder organizational memory (e.g., Nelson and Winter, 1982; Engenström et al., 1990; Walsh and Ungson, 1991). If apprenticeship conditions actually dissolve, the resurrection of tacit knowledge often means reinventing it. As MacKenzie and Spinardi (1995: 46) note, “explicit knowledge, if widely diffused and stored, cannot be lost. Tacit knowledge, however, can be lost. Skills, if not practiced, decay. If there is no new generation of practitioners to whom tacit knowledge can be transmitted it may die out altogether.” Tacit knowledge recovery “cannot simply be a matter of copying the original, because there is no sufficient set of explicit information or instructions to follow” (MacKenzie and Spinardi 1995: 46). For instance, accessibility to Antonio Stradivari’s or Guarneri del Gesù’s original violins is a necessary but not a sufficient condition for replicating these instruments because the unique tacit knowledge of the Cremonese masters is no longer available (Cattani, Dunbar, and Shapira, 2013). In fact, one must reinvent lost tacit knowledge because it cannot be transmitted “through the medium of the written word” (Collins, 1974: 177). These considerations relate to all products where the relevant knowledge lacks an explicit scientific foundation and so is not accessible simply through publications, patents or other knowledge repositories. Our case analysis describes how Steinway & Sons supported its claims of craft authenticity by preserving its apprenticeship system, by retaining key employees who knew the tacit knowledge in piano production and so had access to such knowledge despite production interruptions, by continuously investing in innovation and improving the production process as indicated by the patents obtained over the years, by having involved family members directly familiar with all levels of the company’s operations; and keeping most of the firm’s core activities in-house. Because Steinway pianos are made by the Steinway organization they can still be made today, whereas today one can only make copies of Cremonese violins.
The paper suffers from the usual limitations. An individual case study does not yield results that generalize to other cases. Rather, it can provide rich historical, organizational and sociological material “through which to develop and articulate theoretical approaches contributing to improved social scientific explanation” (Johnson, 2007: 122). In-depth historical studies provide richer contextual evidence and finer-grained descriptions of micro-level decisions, actions – including the actors who make them – and the processes through which Steinway & Sons built and managed authenticity and then preserved it despite facing significant challenges over time. It is also possible that over the years, important sources of information and pieces of knowledge were lost, jeopardizing our understanding. Although we triangulated our sources, even a careful analysis of available historical and biographical sources does not eliminate the possibility that time-contextual circumstances might affect our interpretations, particularly of events that occurred in the distant past. Despite these limitations, our study builds on Thompson’s (1967) notion of a technical core and shows how bases for the attribution of authenticity are embedded in its design, in how it evolves and in how it is maintained over time. Future research may extend the framework to better understand other intervening mechanisms that affect the process of developing authenticity as it occurs for an organization in a particular field.

CONCLUSION

One of the implications of viewing authenticity as a social construction is to portray it as an outcome of a “quasi-random process that cannot be sorted out until after the fact” (Carroll and Wheaton, 2009: 256). Embedding authenticity in the structure and operations of an organization, however, reveals why some constructions are perceived more credible (i.e., genuine or real) than others. The present study covers a relatively long period to trace out the key events and actors (including piano makers, performers, critics and users) involved in the process that led to the
emergence of the ‘piano’ as a socially desirable category of musical performance instrument. Only after this category emerged could the credibility of makers’ claims start to be gauged. The piano became a recognized category of musical performance instrument during the second half of the eighteenth century. Then as a result of competition among piano manufacturers, several crucial technological advancements were introduced that improved concert piano performance until the technology stabilized in the second half of the nineteenth century. While a consensus on the technical standards that a concert piano performance should satisfy stemmed from repeated interactions among piano makers, critics, performers and users – also via contests and exhibitions in both Europe and the US – organizations continued to strive to differentiate their offerings from those of their competitors. Focusing on how an organization develops craft authenticity by using true to the craft techniques, tools and processes in its technical core and how it incorporates key audience members to provide feedback and suggestions for its product design efforts is critical for explaining why some firm offerings are perceived to be more authentic than others. Indeed, audiences assess differences by evaluating competing claims based on the type of techniques, tools and processes organizations use to produce their products or services and the judgments expert users make of them. The case analysis showed how Steinway & Sons developed its pianos and, in particular, how its “D” grand piano came to be recognized as the authentic performance piano among the virtuoso performers, critics and elite users.

Indeed, studying authenticity as embedded in an organization’s core features makes it possible to establish a direct link to Thompson’s (1967) notion of technical core. Building on Thompson’s technical core reveals how organizations are organized and what strategies they adopt to develop and maintain their reputation of producing ‘authentic’ products or services. The case analysis has described some of the key decisions and initiatives through which Steinway & Sons first established and then extended its technical core as the company strove to reduce or eliminate
uncertainty and potential threats to its ability to produce true to the craft grand pianos. Although in the end it is the audience that must be “persuaded” that an organization’s claims are authentic, the credibility of those claims is also to some degree under the control of that organization and the Steinway family realized this and sought to exercise such control. While previous work tends to focus on how audiences evaluate those claims and whether they meet criteria for inclusion in the relevant category, organizations also shape those evaluations. The longitudinal perspective taken here is helpful in tracing this dynamic interaction between audiences and producers over time, thus providing a more nuanced account of why authenticity is a socially constructed phenomenon but is also an organizational-based phenomenon linked to characteristics of the firm’s technical core.
References


Table 1 – List of Awards Won by Steinway & Sons

- In 1854, Steinway attended its first US exhibition, the Metropolitan Mechanics Institute fair in Washington, D.C. where Henry Steinway, Jr.’s design won 1st Prize.
- In 1855, Steinway exhibited at the American Institute Exhibition in The Crystal Palace, Sixth Avenue and 42nd Street, New York City and won a Gold Medal “for excellent quality.” A reporter wrote the following: “Their square pianos are characterized by great power of tone, a depth and richness in the bass, a full mellowness in the middle register and brilliant purity in the treble, making a scale perfectly equal and singularly melodious throughout its entire range. In touch, they are all that could be desired.”
- In the period, 1855–62, Steinway pianos received 35 medals in the United States alone.
- In 1862, for the International Exhibition in London, Steinway shipped two square pianos and two grand pianos and won a First Prize but not the major prizes.
- In 1867, Steinway won three awards at the Exposition Universelle in Paris: the Grand Gold Medal of Honor “for excellence in manufacturing and engineering pianos,” the grand annual testimonial medal, and an honorary membership of the Société Nationale des Beaux-Arts. The 1867 Exposition Universelle established Steinway as the leading piano choice in Europe.
- In 1876, at the famous Centennial Exposition in the United States, Steinway received the two highest awards and a certificate of the judges after the competition showing a rating of 95.5 of a possible 96.
- In 1885, Steinway received the gold medal at the International Inventions Exhibition in London and the grand gold medal of the Royal Society of Arts in London.
- In 1952, Theodore E. Steinway was awarded the first Lichtenstein Medal by the Collectors Club of New York.
- In 2007, the National Medal of Arts, a presidential initiative managed by the National Endowment for the Arts was awarded to Henry Z. Steinway and presented by US President George W. Bush on November 15, 2007 in an East Room ceremony at the White House. Henry Z. Steinway received the award for “his devotion to preserving and promoting quality craftsmanship and performance; as an arts patron and advocate for music and music education; and for continuing the fine tradition of the Steinway piano as an international symbol of American ingenuity and cultural excellence.”

Source: http://en.wikipedia.org/wiki/Steinway_%26_Sons
<table>
<thead>
<tr>
<th>Inventor Name</th>
<th>Number of Patents</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henry Steinway, Jr.</td>
<td>8</td>
<td>1858-1862</td>
</tr>
<tr>
<td>C.F. Theodor Steinway</td>
<td>45</td>
<td>1868-1885</td>
</tr>
<tr>
<td>Albert Steinway</td>
<td>5</td>
<td>1874-1878</td>
</tr>
<tr>
<td>Henry L. Ziegler</td>
<td>11</td>
<td>1888-1908</td>
</tr>
<tr>
<td>Paul H. Bilhuber</td>
<td>19</td>
<td>1922-1953</td>
</tr>
<tr>
<td>Frederick A. Vietor</td>
<td>2</td>
<td>1931-1936</td>
</tr>
</tbody>
</table>

Table 3 – Example of a Steinway & Sons’ Advertisement in the 1920s

STEINWAY
“The Instrument of the Immortals”

“STEINWAY” one the fall-board of a piano stamps its owner a competent judge of artistic worth. There is no question of choice once the Steinway is heard or played. It is the supreme achievement of art and craftsmanship.

STEINWAY & SONS
109 West 57th Street (New Steinway Hall) New York

Source: The Music Trades, November 20, 1926.
Table 4 – Profits and Losses 1927-1950

<table>
<thead>
<tr>
<th>Year</th>
<th>Profit &amp; Loss</th>
<th>Year</th>
<th>Profit &amp; Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921</td>
<td>325,000</td>
<td>1946</td>
<td>233,112</td>
</tr>
<tr>
<td>1922</td>
<td>468,704</td>
<td>1947</td>
<td>528,791</td>
</tr>
<tr>
<td>1923</td>
<td>955,000</td>
<td>1948</td>
<td>434,944</td>
</tr>
<tr>
<td>1924</td>
<td>1,450,000</td>
<td>1949</td>
<td>154,979</td>
</tr>
<tr>
<td>1925</td>
<td>1,112,000</td>
<td>1950</td>
<td>181,737</td>
</tr>
<tr>
<td>1926</td>
<td>1,090,000</td>
<td>1951</td>
<td>434,487</td>
</tr>
<tr>
<td>1927</td>
<td>710,000</td>
<td>1952</td>
<td>54,276</td>
</tr>
<tr>
<td>1928</td>
<td>690,000</td>
<td>1953</td>
<td>(17,977)</td>
</tr>
<tr>
<td>1929</td>
<td>580,000</td>
<td>1954</td>
<td>(138,510)</td>
</tr>
<tr>
<td>1930</td>
<td>(265,000)</td>
<td>1955</td>
<td>90,788</td>
</tr>
<tr>
<td>1931</td>
<td>(604,500)</td>
<td>1956</td>
<td>129,401</td>
</tr>
<tr>
<td>1932</td>
<td>(1,475,000)</td>
<td>1957</td>
<td>176,337</td>
</tr>
<tr>
<td>1933</td>
<td>(570,000)</td>
<td>1958</td>
<td>115,406</td>
</tr>
<tr>
<td>1934</td>
<td>(397,000)</td>
<td>1959</td>
<td>232,934</td>
</tr>
<tr>
<td>1935</td>
<td>(303,000)</td>
<td>1960</td>
<td>383,814</td>
</tr>
<tr>
<td>1936</td>
<td>62,714</td>
<td>1961</td>
<td>512,710</td>
</tr>
<tr>
<td>1937</td>
<td>26,060</td>
<td>1962</td>
<td>589,523</td>
</tr>
<tr>
<td>1938</td>
<td>(395,306)</td>
<td>1963</td>
<td>620,951</td>
</tr>
<tr>
<td>1939</td>
<td>(84,983)</td>
<td>1964</td>
<td>734,389</td>
</tr>
<tr>
<td>1940</td>
<td>(39,903)</td>
<td>1965</td>
<td>1,058,472</td>
</tr>
<tr>
<td>1941</td>
<td>142,612</td>
<td>1966</td>
<td>1,037,225</td>
</tr>
<tr>
<td>1942</td>
<td>(158,256)</td>
<td>1967</td>
<td>790,159</td>
</tr>
<tr>
<td>1943</td>
<td>208,529</td>
<td>1968</td>
<td>897,955</td>
</tr>
<tr>
<td>1944</td>
<td>(450,581)</td>
<td>1969</td>
<td>668,009</td>
</tr>
<tr>
<td>1945</td>
<td>(160,685)</td>
<td>1970</td>
<td>669,824</td>
</tr>
</tbody>
</table>
Table 5 – Reduction of Expenses in Concert & Artist Department Service

A. Leave the servicing of Paderewski, Rachmaninoff and Hofmann unchanged.

B. Status of artist of d-e-f service (Cortot, Friedman, Horowitz, Gabrilowitsch) to be changed as follows:

We furnish concert grands and assign tuner. We pay tuner’s salary while on tour with the artist but all the tuner’s expenses on tour, such as railroad fare, hotel bills, maintenance, etc. to be borne by the artist. At the end of the season, the total expense of expressing concert grands to be divided 50-50 between the artist and ourselves.

C. Levitzki, who heretofore had d-e-f service, to be put on purely local service on the same basis as the other artists under “D”.

D. All artists, without exception, who have had our free local service are to pay $25.00 toward the expense of servicing them in cities where we have our pianos stationed. The artist to bear the entire transportation costs for delivering grands to places where we have no pianos stationed.

E. The supplying of hotel pianos to be at the expense of the artist, meaning that they will have to pay for the transportation.

F. Raise the service rate for concerts in New York City uniformly to $20 for any of the standard concert halls in Greater New York, such as Carnegie Hall, Town Hall, Mecca Temple and some of the theatres in the Theatrical district where concerts are given.

G. Cut all subventions out, with the exception of Paderewski and Josef Hofmann, whose status as mentioned under “A”, remains unchanged.

These Measure together with the considerable savings to be effected through the reduction of such expenses as contributions, purchase of tickets, etc. should reduce the total Concert & artist Department expenses to about $75,000. At a Meeting of the Board of Directors in Steinway Hall, New York on August 25, 1931, at which Mr. Theodore E. Steinway presided, the above suggestions were unanimously approved.

A. W. Greiner
Table 6 – Grands and Uprights during 1920s-1940s

<table>
<thead>
<tr>
<th>Year</th>
<th>Grand</th>
<th>Upright</th>
</tr>
</thead>
<tbody>
<tr>
<td>1926</td>
<td>6,081</td>
<td>213</td>
</tr>
<tr>
<td>1930</td>
<td>2,379</td>
<td>NA</td>
</tr>
<tr>
<td>1932</td>
<td>888</td>
<td>12</td>
</tr>
<tr>
<td>1935</td>
<td>1,367</td>
<td>NA</td>
</tr>
<tr>
<td>1936</td>
<td>3,620</td>
<td>0</td>
</tr>
<tr>
<td>1937</td>
<td>3,061</td>
<td>0</td>
</tr>
<tr>
<td>1938</td>
<td>1,580</td>
<td>1,008</td>
</tr>
<tr>
<td>1939</td>
<td>1,913</td>
<td>2,175</td>
</tr>
<tr>
<td>1940</td>
<td>NA</td>
<td>2,231</td>
</tr>
<tr>
<td>1941</td>
<td>2,195</td>
<td>3,406</td>
</tr>
<tr>
<td>1942</td>
<td>1,411</td>
<td>1,454</td>
</tr>
<tr>
<td>1943</td>
<td>248</td>
<td>371</td>
</tr>
<tr>
<td>1944</td>
<td>NA</td>
<td>957</td>
</tr>
</tbody>
</table>

Table 7 – Total Number of Patents by Piano Component Over Time

<table>
<thead>
<tr>
<th>Year</th>
<th>Activator (keys, key bed, hammers, action, lyre, pedals)</th>
<th>Vibrator (strings, pins, pin block, capo, tasto bar, grafte, plate)</th>
<th>Resonator (bridge, soundboard, ribs)</th>
<th>Case and frame</th>
<th>Designs</th>
<th>Manufacturing technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1853-1867</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1868-1889</td>
<td>22</td>
<td>11</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>1890-1929</td>
<td>1</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>1930-1945</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1946-1972</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1973-2000</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
The Rock  
Camden, Maine  
23 July 1932  

Mr. Frederick Vietor  
Steinway & Sons  
109 West 57th Street  
New York City  

My dear Mr. Vietor:  

Thank you for your letter of July 22nd informing me what Dr. White has said re the "Spectrograph." You may be assured that I shall not make any use whatsoever of this information, as you request.

The so called "scientific research" in tone production in order to ascertain whether or not a tone is perfect, is ridiculous because, tone production by musical instruments is for the ear and not for the purpose of furnishing a perfect diagram. Suppose, scientifically, a sound is perfect, but the piano or violin sound like Hell -- what good is it?

Of course it would be interesting to know why a Steinway sounds better than other pianos, but this is as far as one can reasonably go. All the rest is just an advertising stunt.

Here, all is nice and pleasant; the weather, so far, has been very kind to us, and we have been doing quite a lot of boating.

My Concert Grand is rendering excellent service, and I find that my wrist work has improved because of the more rapid action of the keys.

Hoping that you, also, are enjoying a pleasant summer, and with kindest greetings to all of our mutual friends, I am,

Most sincerely yours,  
Josef Hofmann

Table 9 – Letter from Frederick A. Vietor to Josef Hofmann

The Rock,  
Camden, Maine  
27 July 1932  

Dear Mr. Hofmann:  

Thank you very much for your interesting letter of July 23rd.  

In connection with "Scientific Research," it might interest you to know that we made a very careful electrical study of the soundingboard and learned that it vibrates like a diaphragm and not in sections as the old sand vibrations, (what is, putting sand on the soundingboard, striking various notes, then watching the swirls) indicated.  

We also found out that the construction of the soundingboard, which, as you know, was done merely in a trial and error method, is as near perfect as a board made of spruce with pine ribs can be constructed. We were also interested to learn where the center of vibration of the soundingboard lies, but with all the scientific research we were not able to improve what long years of experience of practical pianomaking had built up.  

As you suggest, it might be very interesting to know from a scientific analysis of the tone, why the Steinway is better, but just at present we are not undertaking any work of this kind, except that which will bring us direct results in the building of Steinway pianos. Some time in the future, when I hope money will again be more plentiful, we will be most interested to undertake such a scientific analysis of the Steinway tone.  

It pleases me greatly to hear what you said about your concert grand equipped with the new Balance Rail Bearing. I feel convinced that this is a step forward in construction and that strange as it may seem, it is most effective in the concert grand. I believe I told you that we are now building as a regular stock article all the concert grands with this device, as well as the graduated rebound of the key, the three steps being the bass at about 20 to 22, the middle 22 to 25 and the treble 25 to 28. In this connection we are also placing the leads in the keys as near the balance rail as possible so that less inertia has to be overcome in starting the key on its downward path.  

I am so glad to hear that you are having a pleasant summer and can only say that I am enjoying bachelordom in New York City while my family is up in the Cape. Taking it all in all, New York City is not such a bad summer resort.  

With kindest regards,  
Most sincerely yours,  
Frederick A. Vietor

THE "DIAPHRAGMATIC" SOUNDBOARD
Patented August 18, 1936 and February 9, 1937
Inventor: Paul H. Bilhuber

The "Diaphragmatic" Soundboard may be described as a soundboard that differs from all others in that its thickest portion is in the center of the soundboard area, and tapers there from toward all edges. By this construction the mass tends to be concentrated at the center and flexibility to be concentrated at the edges to compensate for the rigidity of fastening.

The object of this construction is to cause vibration of the soundboard as a whole instead of sectionally or segmentally, such as in a diaphragm fixed at its edges and with a free center.

The maximum amplitude of vibration in the new soundboard exists at or near the center, irrespective of the note or notes struck. The advantage of this diaphragmatic mode of vibration is the absence of secondary vibrations in which portions of the soundboard vibrate segmentally. The action in the new soundboard is a piston-like movement, of greatest amplitude in the center, and decreasing almost uniformly from this center toward the periphery.

This diaphragmatic action of the soundboard is assisted by a particular method of mounting, also new, and covered by U.S. Patent. In previous methods of mounting, cross strains were created so that the vibration of the soundboard as a single diaphragm was impossible, and undesirable segmental or partial vibration could not be entirely obviated. In the new mounting, all distortion and buckling strains are eliminated, and the soundboard best responds to the vibrations of the piano strings. The new construction, now thoroughly tested, is incorporated in all Steinway pianos. It assists materially in the production of a more resonant, richer tone of longer duration.

STEINWAY & SONS
Steinway Hall
109 West 57th Street
Table 11 – Key Events in Steinway & Sons History

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1836</td>
<td>The German cabinet and piano maker Heinrich Engelhard Steinweg builds his first piano in the kitchen of his home in Seesen, Harz. 482 more pianos are to follow within the next decade.</td>
</tr>
<tr>
<td>1850</td>
<td>Heinrich Engelhard Steinweg and his family emigrate to the United States of America.</td>
</tr>
<tr>
<td>1853</td>
<td>After changing the family name to “Steinway”, Henry Engelhard Steinway and his sons founded the company of Steinway &amp; Sons in a Manhattan loft on Varick Street.</td>
</tr>
<tr>
<td>1855</td>
<td>First official public recognition of the prime quality of the Steinway pianos on the occasion of the “American Institute Fair” at the New York Crystal Palace.</td>
</tr>
<tr>
<td>1866</td>
<td>Steinway &amp; Sons opens the first Steinway Hall on 14th Street. With a main auditorium of 2,000 seats, it becomes New York City's artistic and cultural center, housing the New York Philharmonic until Carnegie Hall opens in 1891.</td>
</tr>
<tr>
<td>1867</td>
<td>Steinway &amp; Sons receive high commendation in the official report on the “Paris World Fair”.</td>
</tr>
<tr>
<td>1871</td>
<td>In 1871, Henry Sr. dies and sons C.F. Theodore and William take over operations.</td>
</tr>
<tr>
<td>1875</td>
<td>Opening of the sales branch, Steinway Hall, in London.</td>
</tr>
<tr>
<td>1880</td>
<td>Foundation of the Hamburg Steinway factory on Schanzenstraße.</td>
</tr>
<tr>
<td>1904</td>
<td>Opening of the showroom (Steinway-Haus) on Jungfernstieg, Hamburg.</td>
</tr>
<tr>
<td>1909</td>
<td>Opening of the Berlin Steinway branch on Budapester Straße.</td>
</tr>
<tr>
<td>1923-1928</td>
<td>The new Steinway factory on Rondenbarg is erected.</td>
</tr>
<tr>
<td>1953</td>
<td>Opening of Steinway-Haus on Colonnaden in the heart of the city of Hamburg. Sale of the old Schanzenstraße factory.</td>
</tr>
<tr>
<td>1972</td>
<td>CBS Inc. buys Steinway &amp; Sons. Incorporation into the Columbia Group.</td>
</tr>
</tbody>
</table>

18 Adapted from http://www.steinwayshowrooms.com/about-us/steinway-history
Figure 1 – Advertising: Steinway and Ayer in Tune for 60 Years (source: Robert Alden, New York Times, November 8, 1960)

Paderewski
and the
Steinway Piano

My joy is in the grandeur, the power and the ideal beauty of the tone and the perfect mechanism of the Steinway is unbounded. All who play your Pianos can but thank you. I do, and at the same time congratulate you most heartily.

Your very devoted
I. J. Paderewski.

The Steinway Pianos are acknowledged to be the Standard Pianos of the World. Paderewski's recital will take place next Tuesday evening at Krueger Auditorium.

STEINWAY & SONS,
Steinway Hall, 157 and 159 E. 16th St.,
New York