ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF ARTS AND SOCIAL SCIENCES

INDIVIDUAL GUITAR MAKER'S BUSINESS OPTIMIZATION

M.Sc. THESIS

Ali SEZEN

Dr. Erol Üçer Center for Advanced Studies in Music
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İSTANBUL TEKNİK ÜNİVERSİTESİ ★ SOSYAL BİLİMLER ENSTİTÜSÜ

BİREYSEL GİTAR YAPIMCISININ İŞ MODELİ OPTİMİZASYONU

YÜKSEK LİSANS TEZİ

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Ali SEZEN, a M.SC .student of ITU Graduate School of.Arts and Social Sciences, student ID 409141110, successfully defended the thesis entitled "INDIVIDUAL GUITAR MAKER'S BUSINESS OPTIMIZATION", which he prepared after fulfilling the requirements specified in the associated legislations, before the jury whose signatures are below.

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FOREWORD

Studying and practicing lutherie and its business led me write this thesis and conduct the surveys in order to collect and share the information of what is missing in communication beneath luthiers or players and how can an individual survive by practicing lutherie. I am really grateful to all individuals who participated in the survey and shared information with me.

I would like to thank to my advisor Assoc. Prof. Yelda Ozgen Ozturk and Yamac Kaya for their constant support and Assoc. Prof. Dr. Belma Kurtişoğlu for her substantial guidance throughout the work.

Finally, I would like to express my everlasting gratitude to my parents, Murat SEZEN and Esin ŞENTÜRK, for giving me the support and opportunity to pursuit my goals in order to comprehend what is to be an artisan.

May 2017

Ali SEZEN
Luthier

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ABBREVIATIONS

CAD **:** Computer Aided Design

CAM **:** Computer Aided Manufacturing

CNC **:** Computer Numeric Control

OEM **:** Original Equipment Manufacturer

LASER **:** Light Amplification by Stimulated Emission of Radiation

JIT **:** Just in Time

WIP **:** Work in Progress

MOP **:** Measure of Performance

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INDIVIDUAL GUITAR MAKER'S BUSINESS OPTIMIZATION

SUMMARY

The purpose of this thesis is mainly to cover the fundamentals of lutherie on both management and production ends and to provide a functioning business model.

Lutherie is generally considered as a subject mainly focuses on woodworking, design and acoustics. People who tend to learn the craft and become professional luthiers are prioritizing these aspects more than any other. But what is missing during in this process are the elements of management (both for the production and the product) and the fundamentals of managing a workshop.

Although main focuses are all the very essence of this occupation, establishing a successful custom guitar brand requires more than all of these. This thesis aims to firstly identify the profession on multi-perspective level. For that, this thesis will provide a review of business models in mass production sector alongside two questionnaires constructed by my own business experience with open ended and closed ended questions directed to professional luthiers and professional guitars players internationally by SurveyMonkey (Appendix C). After cross referencing and analyzing the data provided by the surveys to define the deficiencies and opportunities in the business and the market, main focus will be on sales and production modeling, publicity of work and the areas that all luthiers should be taking advantage of such as expositions, festivals, endorsement deals which the data from surveys will provide reference points.

Becoming a master luthier requires time, labor, woodworking experience and developing a design approach towards the instrument of choice. There are technological and informational advantages of the 21st century to manage time and labor more efficiently. This advantages covers production and management models which will assist to develop a more optimized establishment. After portraying the production fundamentals in general, emphasizing the general management factors of an individual workshop will be the main concentration.

First of all, the establishment's initial expenses, production expenses and promotional expenses needs to be identified. For that, the thesis will use the surveys directed to professional luthiers and a review of a business plan. The data on hand, will be useful

to prepare a feasibility report detailed enough to prepare individuals who are interested in the job professionally. This includes stock expenses, power tools and technology based tool usage, advertisement, exposition attendances and a model endorsement deal (Appendix B).

Secondly, based on educated guessed data and individual experience, a customized business plan template will be prepared for individual workshops. This will include mainly project management, risk management, financial analysis and planning principles.

Considering this work is being prepared for individuals who have the professional approach towards guitar making and the fact that lutherie is a subject that needs to be examined individually, the thesis will exclude the know-how of lutherie.

With the data gathered, the thesis will examine the business models of well-known international expositions which will guide the individuals to be more active in promotional and networking aspects.

In conclusion, this paper will present a preliminary framework for luthiers who wants to set up their own guitar making brand.

BİREYSEL GİTAR YAPIMCISININ İŞ MODELİ OPTİMİZASYONU

ÖZET

Bu tezin amacı, lüthiyerliğin üretim ve işletme hususlarını inceleyerek, fonksiyonel bir iş modelinin üretimini sağlamaktır.

Lüthiyerlik genel olarak ağaç işçiliği, tasarım ve akustik esaslarına dayanan bir zanaat olarak kabul edilir. Mesleği öğrenerek profesyonel olan girisimcilerin de öncelikleri bu esaslardır. Ancak bu süreçte atölye işletmesi, üretim organizasyonu ve marka yönetimi gibi hususlar gözardı edilerek tamamen üretim odaklı bir çalışma içerisine girilir.

Her ne kadar bu unsurlar işin temelini oluştursa da; başarılı bir butik enstrüman markası yaratmak bu temellerden fazlasını gerektirir. Çalışmanın öncelikli amacı mesleği birden fazla düzlemde analiz etmektir. Bu analiz için gereken referans veriler seri üretim sektöründeki iş modellerinin incelenmesinden ve uluslararası platformda profesyonel gitar yapımcılarına ve profesyonel gitaristlere ucu açık ve kapalı sorular soran kendi iş tecrübem ile oluşturulmuş iki ayrı anket ile oluşturulacaktır (Ek C). Anket ve incelemelerden elde edilen veriler birbirleri ile karşılaştırılıp pazarın eksiklikleri ve avantajları belirlendikten sonra, tezin odağı satış ve üretim modellemesi, ürünün tanıtımı ve fuar katılımları ve tanıtıcı sanatçı anlaşmaları gibi luthiyerlerin faydalanması gereken alanlar olacaktır.

Bir lüthiyer olmak ağaç işçiliği tecrübesine, yapılacak enstrüman için oluşturulacak tasarım planına ve iş gücüne gerek duyar. Günümüzde bu hususlar, 21. yy'ın sunduğu teknoloji ve bu teknolojiye ulaşımın kolaylığı avantajları ile çok daha hızlı, hassas ve daha az iş gücü ile yapılabilir.

Bu avantajlar üretim ve işletim modellemelerini de kapsayarak daha optimize bir işletme oluşturulmasına yardımcı olacaktır. Çalışma, üretim esaslarından genel olarak bahsettikten sonra, bireysel atölye yönetimi hususlarını incelemeye ağırlık verecektir.

Öncelikli olarak işletmenin temel giderlerleri, üretim giderleri ve tanıtım giderleri belirlenmelidir. Bunun için tez, profesyonel lüthiyerlere yöneltilen anketi ve bir iş modeli incelemesini kullanacaktır. Elde edilen veriler ilgili profesyonellere yol gösterecek detaylı bir fizibilite raporu oluşturmaya yardım edecektir. Rapor, ağaç ve

ağacı işlemeye yarayacak makinelerin maliyet ve zaman oranını, tanıtım operasyonunu, fuar katılımlarının fizibilitesini ve örnek bir tanıtıcı sanatçı anlaşmasını kapsayacaktır (Ek B). Eldeki bilgiler ve bireysel tecrübe doğrultusunda bireysel bir atölye için özelleştirilmiş bir iş modeli planı oluşturularak planlama, proje yönetimi, risk yönetimi ve finansal analiz hususları incelenecektir.

Çalışmanın odağında gitar yapımı ile profesyonel bir mecrada ilgilenmek isteyen bireyler olduğu varsayımı ve enstrüman yapımı bilgisinin, ayrı olarak derinlemesine incelenmesi gereken bir konu olması sebepleri ile, lüthiyerlik teknik bilgisi içerik dışı bırakılmıştır.

Eldeki veriler ile tez, bilinen uluslararası fuarların iş modellerini inceleyerek tanıtım ve iletişim ağı kurmak hususlarında bireylerin daha faal olmasına rehberlik edecektir.

Sonuç olarak bu tez, profesyonel gitar yapım markası kurmak isteyen lüthiyerlere bir ön çalışma oluşturma amacı taşır.

1. INTRODUCTION

Lutherie is a craft that has been practicing since the beginning of baroque period. There is a large variety of methods and approaches towards the discipline. First observed predecessors of the craft were positioned vastly in Europe. After the technical developments of guitar making by Louis Panormo and Georg Staufer, and the schematic innovations of guitar by Antonio Torres Jurado, the European School of guitar Lutherie took a new direction. International acceptance of this new design intrigued builders from all over the world.

Trained with the apprenticeship tradition, vast majority of European luthiers kept using the techniques that their predecessors used. This led the traditional techniques to be perfected by repetition. However, this approach simultaneously prevented these luthiers from innovating the instrument technically unlike their contemporaries around the world.

With the demand internationally, techniques and understanding of European School of guitar making took a turn. Makers around the world (especially Germany and North America) started to use this new design of the guitar, without the traditional approach, which orientates luthier to the idea of one right way to build a guitar.

One can practice Lutherie in different ways suited for him/herself. As long as the product is a valid instrument to both the luthier and the performer standards, the corresponding relation between designing a guitar and building a guitar may differ from builder to builder.

Recent designs and modern interpretations of the guitar is being made by various luthiers, and by big mass production guitar companies all around the world. "Bigger factories do not have a real flexibility to adapt to individual needs regarding sound, playability, looks.

With the technological and informational benefits of 21st Century, individuals and firms can apply a more elaborate business methodology that serves as a model for parties to optimize their methods of building, advertising, funding, managing their products and their operations.

It is possible to produce good quality guitars in a factory environment but I haven't ever seen checking tap tones of braces picking the best bracing material… An individual luthier has a greater quality control, freedom, flexibility. I believe a guitar will reflect the attitude used to build it and will be grateful if we approach it with care and attention". (Prohaszka, 2009)

However, there aren't any kind of solid methodologies projected in literature about mass guitar production business model. Luthierie in the literature on the other hand, can offer so less about business and production methodologies, but provides detailed explanations of the fundamental know-how. Considering these two business ventures both aims to gain revenue from the production, it's possible to expect the discretion about how they operate and how they gain revenue. In order to clarify, this work seeks to serve as an exemplary business model for lutherie field. Seeking to establish a viable business and production methodology, the study conducted two surveys which directs open and close ended questions to 19 professional luthiers and 24 professional guitarists internationally via SurveyMonkey. The questions which are developed with my own experience in the field, aims to extract data about both market and the production such as the purchasing habits and tendencies of guitarists, the production approaches and preferences of luthiers, the informational rating about global events and associations of both participant groups and the interchange of information amongst them. The collected data is used for cross referencing and analyzing the deficiencies and opportunities of the market, the average production times and technicality references of luthiers and the correlation between what luthier can offer and what market demands.

With the analytic results of the survey and case studies of global instrument making expositions and reviews of mass production business model, the thesis aims to fill the void of the information of an optimized business plan for lutherie as mentioned above by establishing a functioning business model based on the data provided by the surveys and utilization of production concepts in mass production sector. Applying the referred business model which will be projected in further sections, will help luthiers to improve their production quantities, annual revenues and global awareness of their brand.

Because of this study's aim, the reference for a luthier for this work and its questionnaire will be a fully capable, experienced, professional luthier. This reference will serve to the work for stabilizing the production hypothesis as the individual has already have a design, a model or an idea of a guitar that can be commercially and artistically successful.

Aspects such as design, research and development, making process, materials and know-how will be excluded from this work due to its main focus will only be the business and management relation to the profession. This includes, revenue model, production management, material acquisition, event attendances, distribution channels, endorsements and creating demand.

1.1 Conceptual background

For the sake of clarity in perception, it is vital to identify basic concepts and terminology being used throughout the thesis. Although the thesis presents a vocational glossary for the terminology of the craft and the business (Appendix A), explanations of some fundamental concepts is in order due to clarify expressions of the subjects.

1.1.1 Luthier

A luthier is someone who builds stringed instruments. The word luthier comes from French word “lute”. The craft generally divided into two main categories, making bowed or plucked/strummed instruments such as violin and guitar. Luthiers can also educate apprentices in order to contribute to the discipline for keeping it sustained.

A luthier is responsible for every aspect of an instrument that he/she makes. Whilst in other production techniques uses departmentalization and individual teams for processes like assembly, polishing, design, woodworking (Figure 1.1.1), a luthier deals all of the aspects mentioned before by him/herself.

Figure 1.1.1 : A luthier’s workbench

1.1.2 Woodworking

One of the oldest professions in history, early techniques required manual labor and primitive tools comparing present solutions. Woodworking in lutherie consists usage of shaping tools and know-how of the design and the material in a superior pitch.

With the advances of modern technology and the demands in the sector, the field has evolved. Technologies like CNC machinery, LASER cutting and 3D printing made woodworking process more viable for individuals who can access the technology and the software. These developments made woodworking industry more accurate, cheap and going gradually bigger in quantities.

1.1.3 Guitar

In present day, there is a big variety of guitar designs and models being made all around the world both by luthiers and mass manufacture companies. Nevertheless, to keep the business model approach applicable generally in lutherie, the thesis will consider guitar and its types basically as classic, electric and acoustic.

1.1.3.1 Classical guitar

The eldest member of the guitar family used generally in classical music. Made out of solid wood, classical guitar consists of a resonator (soundbox) attached to a neck. Chronologically, first precedents had gut strings instead of the nylon polymer alternatives that are in use today. With the latest design of modern classical guitar developed by Antonio Torres Jurado in 1840, guitar took a new surrogate (Figure 1.2) by visual and timbre means and turned into the instrument as known as classical guitar today.

Figure 1.2: Mass Produced Classical Guitar by Savage Guitars, Adalid Model (Savage Guitars, 2016)

1.1.3.2 Acoustic guitar

Also known as “Steel Sting Guitar”, acoustic guitar is one of the most used guitar types in the world. Building approaches towards the acoustic guitar always been in correlation with classical guitar.

The most significant distinctions between a classical guitar and an acoustic guitar is the string preference and dimensions. While the classical guitar has nylon strings, the acoustic guitar has steel strings instead. Also made out of solid wood, acoustic guitar has a resonator shaped slightly larger or smaller than a classical guitar body according to the design. (Figure 1.3)

Figure 1.3: Mass Produced Martin OM 42 Model (Martin Guitars, 2017)

1.1.3.3 Electric guitar

Invented in late 1930’s, electric guitar is one of the most preferred instruments by stage performers. Two magnetic pick-ups installed on the front end of the body enables performers to plug their instruments into amplification units to boost the dynamic range and even to temper with the sound (Figure 1.4). Also using 6 course steel strings, electrical guitar is the flagship of guitar mass market.

Figure 1.4: Mass Produced Gibson Les Paul “Black Beauty” (Gibson Guitars, n.d.)

1.2 Diagnosis

In order to develop a valid methodology of business, it is essential to diagnose the present view of lutherie and to emphasize its progress as a craft to a business. After establishing the current approach, designating the correlations and discrepancies between mass production and lutherie will assist this work to filter and utilize the vital aspects of production and business.

1.2.1 Current approach

Considering lutherie is a discipline, present day's approach towards guitar making can be observed by the progress of the conceptual perception. Lutherie, transformed from being an object of enthusiasm, historical values and curiosity to a profession which requires artisanal values, business mindset and competition in order to make a living. With these developments, a generation of luthiers has evolved not unlike their predecessors. From the beginning of 20th century, Lutherie was practiced by experienced and trained professionals rather than hobbyists. This transition led an international consensus of the conception by luthiers.

As Ervin Somogyi explains;

> An entire body of literature has been created by contemporary luthiers. Modern contemporaries have preserved, refined and extended an originally European tradition of woodworking, and made it viable. The conditions which have made possible the rise of national luthiers' organizations; furthermore, these not only provide active forums for free exchange of information to anyone who has interest in this craft, but are in fact the leading sources of information for young instrument makers overseas.
>
> Lutherie itself has changed as well. It's grown from the enthusiastic passion for the wood, to carefully working amateur and enthusiast, to the serious business of making a living -- with all the jigging, tooling up, scheduling and paper/office work this requires. But the focus and intent of the luthier -- that is, the willingness to make something as excellently as he/she can out of a mindset which values personal creativity, personal involvement in the work, an appreciation of the beauty of what is created, and independence--has held constant. (Somogyi, 2014)

1.2.2 Correlation between handmade and mass produced guitars

There is a significant difference between handmade guitars and factory made guitars. Each made differently with different purposes. Differentiations like market, target

customer, clientele, production techniques dictate the instrument's position amongst its equivalents.

Factory's aim is to build instruments which are adequate enough to sell to mass market. On the other hand, Luthier's aim is to build and instrument which will become an essential tool for the performer. It has no function to compare a mass-produced guitar to a handmade one. Although both products look merely the same, production principals, material preferences and market objectives are vastly different. Designating the fundamental differences between mass produced and handmade guitars will lead a more viable approach towards the correlation extraction process.

1.3 Differentiating aspects

As mentioned in the previous chapters, there is a vast quantity of differentiating aspects between lutherie and mass production. Identifying these aspects enables to establish advantages and disadvantages of these two initiatives. Aiming to use mass production's advantages for utilizing and optimizing them into lutherie, this study will analyze these elements in separated topics.

1.3.1 Dialogue

With a factory made guitar, user addresses the shop owner during the buying process. It is a profitable method of selling for mass market. But when demanding a new instrument design or even facing with a technical problem for instance, player will have to interact with whether a shop service or customer support, not the person who made the instrument. This is where lutherie excels. The survey directed to the professional guitar players around the world, suggests that 79% of the participants prefers to have their instruments maintaining made by a luthier, not a repair service or a shop expert (Figure 1.5). Regardless, it states that building a personal relationship with the individual who actually building the instrument and knows every aspect of it; is the most effective way to create an instrument that serves both player's musical and luthier's technical expectations.

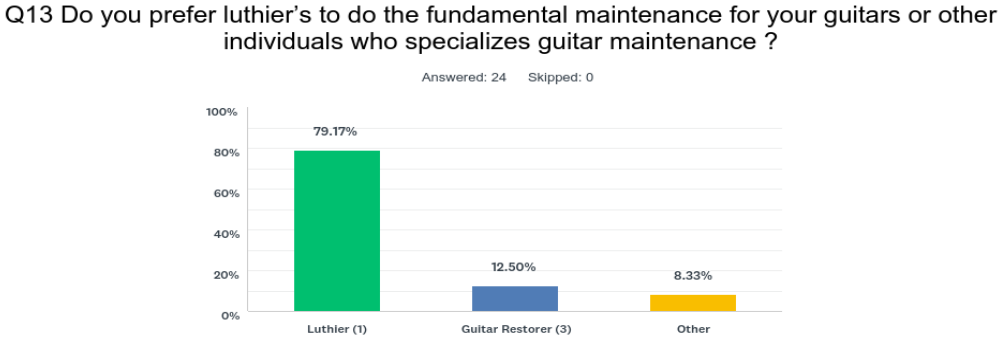


Figure 1.5: Individual Guitar Making Business Optimization Guitarist Survey Question 13

1.3.2 Customizability

Mass production principals require unvarying designs to be categorized and produced in large quantities. This means each guitar carries a brand and a model, will exactly be the same by default. It's generally sufficient for home use. But when customization needed, mass production will have its boundaries because of the production technicality. A luthier can provide a large spectrum of customizable aspects as much as he/she desires as long as the initial design stays intact. This spectrum includes tonality, playability, certain visual aspects and wood options in order to build an instrument that attracts both the performer and the luthier.

1.3.3 Quality

From a mass production point of view, a high quality guitar is defined by the replicability of the components and the assembly qualification criteria like being identical and consistent.

But musicians and luthiers beg differ. From a musician point of view, a quality guitar definition stands for an instrument with great tonal and dynamic range with high level of playability. And in some cases, replicable elements require change in order to achieve desirable instrument. Although this thesis will encourage luthier to use certain elements of mass production techniques, survey directed to professional luthiers both locally and internationally indicates that 58% of participants changes the design each time they start building a new instrument (Figure 1.6).

Although further sections will try to minimize this approach, this kind of know-how will provide the specific tonal and technical qualities that are in need. As a result, to these factors, a custom built instrument will consist -by definition- a more elaborate tonality and responsivity for the player's requirements. These factors are amongst the most differentiating aspects of this two different methods.

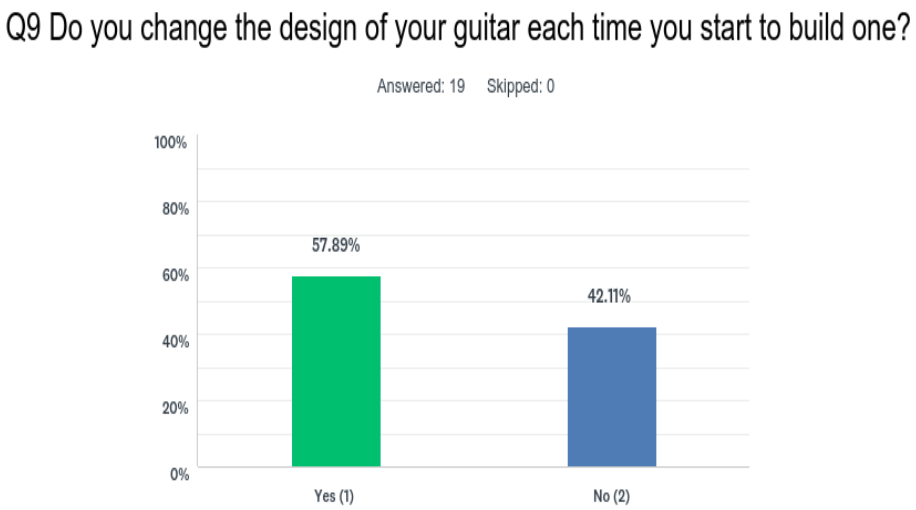


Figure 1.6: Individual Guitar Making Business Optimization Luthier Survey Question 9

1.3.4 Craftsmanship

The level of know-how and skills will differ from luthier to luthier. In mass production case, skill or know-how of the individual who deals with the aforementioned guitar, won't affect the instrument directly because of the replication and mass production principals. As a result, when encountering with a mass produced guitar, all performer can expect is the bare minimum standards of the production line.

A Luthier on the other hand, no matter the level of know-how he/she has, can always interfere with certain dynamics of the instrument to improve it. In spite of the fact that factory made guitars will always have dimensional standards due to the benefit of high precision machinery and departmentalization. But as long as research and development section of the discipline held excluded from the production, instrumental qualities will always be lower than a handmade guitar. This can be explained by several reasons.

First of all, a Luthier has the initiative and capability to temper with the interior and exterior design of the guitar in order to increase tonal and instrumental qualities. Secondly, every guitar a luthier makes, is being built with the search of the best instrument he/she can build. Consequentially, between a mass produced guitar and a handmade guitar, while mass production offers stability and well-known sound of the specific model, a handmade guitar will always have the element of uniqueness.

1.3.5 Playability

Prior to purchasing by the performer, mass produced guitars have their stock neck angles, standardized bridge and fret installation calibrations. Generally, these specifications are not stabilized for performing preferences but to replicate desirable design.

This methodology generates issues such as buzzing frets, intonation problems, high action and physical deformation caused by the weather conditions during the distribution process. To prevent these complications, guitar shops accommodates a guitar set-up employee to finalize setting up the guitar. It means the guitar will be set up by a professional whose concentration is only to set the instrument up for the customer without any knowledge of the instrument's fundamentals.

A luthier on the other hand, won't recognize his/her instrument completed regarding the aspect of playability is in harmony with performer's pre-declared preferences. Having these demands on mind, the Luthier will always provide solution for the specific guitar by him/herself.

1.3.6 Tonal range

The discipline of lutherie firstly teaches individuals who are interested that each minimal dimensional changes in certain components will vastly change the tonal results. Therefore, building a custom guitar is always in constant relation with research of development of the instrument. While dealing with to master tonally and visually successful guitar making, the issue of consistency occurs. This is where mass production comes into prominence.

Mass production structure designed to build guitars with minimum labor, high speed and consistent in finished product. Research and development of guitar tonality cannot establish improvement as it needs to establish in production line. Changing designs and dimensions constantly cannot be tolerated by a factory line due to the standardization requirements of the components.

Because of the reasons mentioned above, performer always will able to reach the instrument of his/her tonal preferences and even higher tonalities instrumentally with a custom designed guitar.

1.3.7 Machinery and luthier

Machinery have the benefit of producing a design repeatedly with identical level of precision (Figure 1.7). While human error factor is non-existent in mass

production, Lutherie tries to avoid human error by experience and repetitive manual labor.

> Many factory guitars are quite good, and many handmade guitars show room for improvement. How successful a handmade guitar is, is largely a function of how experienced the maker is and what specific qualities of design or tone he is known for. No one ought to be surprised to realize that beginners will make beginner's level guitars, and that more experienced makers will make better ones: this is what makes the instruments made by an experienced and mature maker so special. On the other hand, there is considerably less significance to the purchase of an instrument made by a factory simply because it's been in operation for many years. Long, cumulative experience with the materials is not what they are about, and neither are improvements and advances in design which conflict with profitability.
>
> Factory people believe that high-volume assembly of premade and subcontracted parts produces superior products. By the standards of the individual maker, it is possible for factory guitars to be better than individually handmade ones, for all the reasons outlined above. But, in general, factory guitars are "better" only in a limited sense of the word, also for all the reasons outlined above. I wish to emphasize again that handmade and factory guitars are each made with a different intelligence, with different priorities and for different markets. The luthier cannot compete with the factory on the level of price. The factory cannot compete with the luthier on the level of attention to detail, care and exercise of judgment in the work. (Somogyi, 2014)

Figure 1.7: CNC Cutting Bench of Gibson Guitars (Farmer, 2011)

1.3.8 Collaboration

The dialogue between the Luthier ad the performer is always a productive approach towards the desirable guitar for both parties. Exchange of ideas both technically and musically, leads Luthier to build an instrument that will satisfy the performer. It helps to build a common terminology and a consensus on how the guitar should be built in order to meet both builder's and performer's demands. As Pat Metheny mentions about luthier Linda Manzer who also participated in the luthier survey for this thesis:

"Linda Manzer made me a 6-string. It was the instrument I used to record 'Lonely Woman' on Rejoicing. That tune just sparkles because of that guitar. She made me that one guitar, which I immediately fell in love with, and then I said 'Well, how about you make me a 12-string?' The night I got it, I wrote four tunes. It was a totally inspiring instrument."

The survey directed to professional guitar players internationally, suggests that 79% of the participants prefers to exchange ideas and have a consensus with luthier on the visual, technical and musical aspects of the guitar he/she building for them (Figure 1.8).

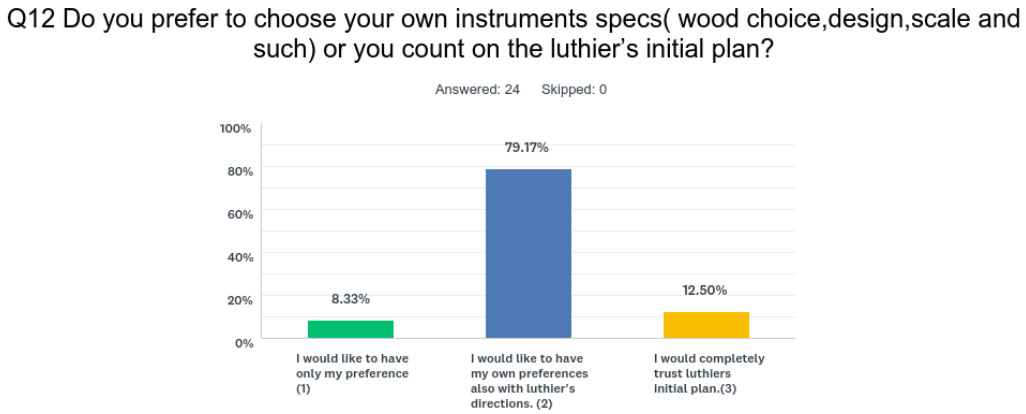


Figure 1.8: Individual Guitar Making Business Optimization Guitarist Survey Question 12

Participating in the building process with the Luthier is also highly educational for the performer. The more one knows about the design, technicality and materials, the more elaborate preferences one can demand (Figure 1.9).

"I met Pat over 20 years ago after a concert and I've had the pleasure and the wonderful challenge of building instruments for him ever since" (Manzer, 2006)

Figure 1.9: Pat Metheny playing Pikasso Guitar in Essaouira, Gnaoua Festival (Manzer, 2006)

1.4 Hypothesis

In a structural point of view, a custom guitar and a factory made guitar is fairly similar one to another. What makes the essential difference are the elements which effects tonality, playability, responsiveness and dynamic range which due to its purpose of being built, a custom made guitar is always having the upper hand against its mass produced equivalent. However much these elements correspond with guitar on musical grounds, it is the production methodology and the tonal design of the guitar what dictates these elements and eventually, the classification of the luthier and his/her instrument amongst his/her respected contemporaries.

In spite of factory made and handmade guitars are two different types of instruments, it is evident that both product requires organizational skills on management, production and advertising ends in order to gain revenue and sustainability as a brand. This study will diagnose differences and common grounds between mass produced and handmade guitars. Establishing similar approaches to the discipline of guitar making on both ends will help the work for analyzing the aspects of mass production and will be a beacon for luthiers to take considerable amount of production and marketing techniques to modify and optimize them into handmade guitar workshop model. For instance, a luthier can use factory production principals such as JIT-KANBAN and WIP production methodologies which will be explained in further sections, to increase the precision and production qualities with the benefit of reducing time and labor. This and similar methodologies and understanding, will

guide luthier to become the owner of a functioning, reputable and professionally made custom guitars workshop.

Understanding the ways of mass production and applying these to desirable workshop or instrument will not be sufficient. Each luthier and their individual designs of guitars are vastly different from each other. The survey suggests 58% of luthiers changes the design of their instruments every time they start to build one. This brings out the importance of individuality in this business.

Although the usage of the same technical equipment and production techniques are beneficiary, the use of technology without proper planning and organization will not cover all the basis. This means the variations and applications of modern production, advertising and commerce techniques which this work planned to analyze, may differ from luthier to luthier when it comes to execution. Which is healthy; variety of techniques indicates the optimization is covering a vast majority of scenarios which different one to another.

The compatible data extracted from the surveys and the analysis of case studies, production methodologies and shifts of technical understanding with the addition of international guitar sellers, expositions and endorsement campaigns case studies which assist individuals to announce their works to an international platform of luthiers and buyers.

This works main objective is to guide people who is interested in this business more than an enthusiast. The surveys, comparisons, analysis and case studies will provide know-how data for an optimal boutique guitar making workshop. This will help to construct a bridge with production qualities of 21st century and artisanal values of lutherie which will lead entrepreneurs to be both sides of the industry.

2. PRODUCTION INFRASTRUCTURE

This section will analyze, compare and utilize mass production's business model elements. Based on the data extracted from the surveys and reviews of mass production business model, elements such as production methodology and its time, finished product quantities, stock management and technology usage will be utilized and will be used to form an individual production based business model.

2.1 Production methodology

Understanding the definition of production and its quality, will provide luthier a precise idea to develop an effective production methodology on the long term (Table 2.1).

Table 2.1: Comparison of Custom Guitar Manufacturing and Mass Production

	Custom Manufacturing	Mass Production
Quantity	Low	High
Manufacturing Method	Manual (Hand Made)	Automated Assembly Lines
Labor Costs	High	Low
Error Risk	High	Low
Adaptation to Requirements	High	Low
Business Model	Made to order	Large inventory / JIT
Production Time	High	Low
Quality Assurance	High	Low

Production quality is the sum of all processes occurring in a production facility whether it is a workshop or a big factory. It means one should approach the concept of building guitars individually both as a luthier and a manager. The thesis grounds its business and work-in-progress (WIP) optimization topics on one of the most globally applied manufacturing systems in all mass production sectors which is just-in-time (JIT) system controlled by KANBAN methodology.

> Just -In-Time (JIT) manufacturing system was developed by Taiichi Ohno which is called Japanese "Toyota production system". JIT manufacturing system has the primary goal of continuously reducing and ultimately eliminating all forms of wastes (Brown et al. [5], Ohno[54], Sugimori et al. [82]). Based on this principle, Japanese companies are operating with very low level of inventory and realizing exceptionally high level of quality and productivity (Richard J. Tersine [62], James H. Greene [30]). JIT emphasizes "zero concept" which means achievement of the goals of zero defects, zero queues, zero inventories, zero breakdown and so on. It ensures the supply of right parts in right quantity in the right place and at the right time. Hence, the old system of material acquisition and, buyer and seller relationships are changed to new revolutionary concepts (Womack et al. [91], Womack and Jones [92], Markey et al. [45]).
>
> Similarly, JIT becomes an inevitable system at plant level, which integrates the cellular manufacturing, flexible manufacturing, computer integrated manufacturing and Robotics (Schonberger [63], Golhar [12]). Due to the technological advancement, the conventional method of push production system linked with Material Requirement Planning (MRP) was changed to pull type JIT production system to meet out the global competition, where the work-in-process (WIP) can be managed and controlled more accurately than the push- production system (Mason Paul [46]).
>
> KANBAN system is a new philosophy, which plays a significant role in the JIT production system. Kanban is basically a plastic card containing all the information required for production/assembly of a product at each stage and details of its path of completion. The KANBAN system is a multistage production scheduling and inventory control system. These cards are used to control production flow and inventory. This system facilitates high production volume and high capacity utilization with reduced production time and work-in-process. (Panneerselvam & Kumar, 2007)

The differentiating diagnosis between mass production and custom manufacturing helps to form the production infrastructure. The production design this thesis will be grounded on, shaped around the assembly processes. This indicates the production methods and tools will be specifically designated for these processes.

Assembly stages of guitar building involves wooden material, dimensioned to final measures with 1 to 2 mm of tolerance. For each part guitar have, this dimensions and the type of wood will differ. This means, individual needs to be responsible of cutting and shaping his/her whole wood stock to desirable dimensions which consumes a great deal of time, labor, workspace and machinery which affects performance stabilization. The ratio between the finished product and efficiency of production time are the key measures of performance (MOP) for all types of production systems.

For any system, the efficiency is measured through a function of related parameters/ factors. Hence these factors must obviously establish close relationship with the focused problem. These factors individually or jointly represent a performance. Blair Berkly J. [4] has given a note on workstation performance in KANBAN controlled shops in terms of average inventories, quality and the ability to meet the demands. It is inferred that the average work-in process (WIP), average flow time, mean cumulative throughput rate and weighted earliness of the job are frequently used as performance measures. Yavuz and Satir [98] have used seven factors in their study, which are as presented below (Table 2.2).

Table 2.2: 7 KANBAN Factors of Yavuz and Satir

1) Mean Cumulative Throughput Rate: It is the ratio of total satisfied demand to the total generated demand.
2) Mean Total Production Lead Time: It is the amount of time spent by a job from entering the system to until completion of all operations, averaged over all completed job.
3) Mean Total Demand Satisfaction Lead Time: It is the time interval between arrival of the demand and satisfaction of the demand.
4) Mean Utilization of Line: It is the mean utilization of the last station in the line.
5) Mean Setup/Run Time Ratio of Line: It is the ratio between the setup time and the run time of last station.
6) Mean Total WIP Length: It is the mean of all in process-inventory levels for the products excluding finished goods (FG).
7) Mean Total Waiting Time: It is the waiting time of all products in all processes and finished goods inventory (FGI).

A general purpose analytical model to evaluate the performance of multistage Kanban controlled production system was developed by Di Mascolo et al. [15]. The performance measures used by them are percentage of demand for back-order, average waiting time of backorder and average work-in-process.

A simulation experiment to evaluate the relative effectiveness of various rescheduling policies in capacity-constrained, JIT make-to-stock production environment is examined by Kern et al. [34]. Three performance measures analyzed by them are average finished goods inventory, total units of sales lost, and measure of schedule instability. Jing-Wen Li [31] has measured three factors for shop performance which are average work-in-process (WIP) inventory, average flow time and average set up time to processing time ratio (ASOTR), which is the ratio of total amount of time spent for setting up machines to the total amount of time spent for processing parts averaged over all machines. Uday S. Karmarker [88] used throughput rate for total work performance. In another study, the priority rule assignment was checked by the following factors by Nabil R. Adam et al. [51] (Table 2.3).

Table 2.3: The priority Rule Assignment factors by Nabil R. Adam

1) The lead time of a job
2) The flow time of the job
3) The staging delay of a job
4) Mean Tardiness

Hemamalini et al. [22] considered the objective function to minimize the sum of weighted flow time, weighted earliness of jobs and weighted tardiness of containers. Shahabudeen et al. [76] used a universal test which may be suited for the MOP in any JIT system, which are percentage zero demand (PZD), mean lead time (MLT) and mean total WIP (MTW) as explained below (Table 2.4). (Panneerselvam & Kumar, 2007)

Table 2.4: Measure of Performance (MOP) elements

1) Percentage zero demand: It is the percentage of total demand immediately satisfied to the total generated demand.
2) Mean lead time: It is the sum of the waiting time, processing time and moving time averaged per station. It is also called as mean flow time.
3) Mean total WIP: It is the average number of KANBAN waiting for each part type at each workstation.

The thesis will use these 3 elements of MOP to build up the production system reasoning their adaptabilities in a vast majority of profitable sectors. This means not only mass production companies but also luthiers can gain advantages from adapting and applying a solid production system. Taking into consideration 63% of professional luthiers who participated in the survey, builds 10 guitars a year (Figure 2.1) and 36% of them spends approximately 140 hours for each guitar (Figure 2.2), labor and machinery for wood dimensioning process can be outsourced to save time, expenses and decrease production times. Instead of investing to industrial level machinery, it's possible to reduce the budget by hiring the machinery and labor from the establishments who are already using computer aided technology for dimensioning and cutting solid materials such as wood. A technologically capable establishment can offer precise dimensioning and cutting with the right data from the luthier.

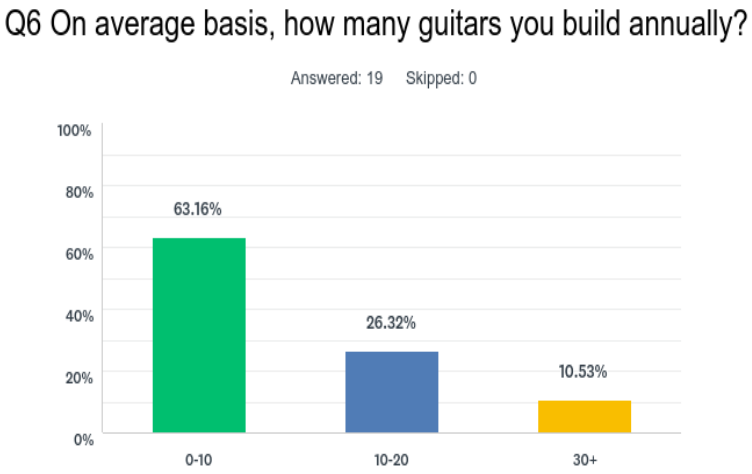


Figure 2.1: Individual Guitar Making Business Optimization Luthier Survey Question 6

Due to the difference of quantities which a factory can provide and a luthier require, the reshaping and dimensioning of relatively small amounts of wood which will be provided by the luthier him/herself, will be completed accurately, rapidly and cheap. This will reduce the total work-in progress (WIP) time, budget and increase precision, stability and bring forward accurate data for research and development for luthier's further studies.

Dimensioned wood stock without industrial level machinery installed in the workshop directs luthier to use the workhours more efficiently and precise. Luthier participants stated that 73% of them uses power tools constantly. But only 15% uses CNC and 5% uses LASER (Figure 2.3). These technologies are substantial to be applied in order to assist the luthier to interchange machinery usage and WIP. Instead of industrial machinery, the substitution should be for small sized power tools which can be used with templates, a final thickness adjustment machinery and specific tools and jigs preferably made by the luthier his/herself. Designing and building the templates and tools will require CAD, CAM, CNC and LASER technology due to the necessity of precision. Fortunately, it is accessible for outsourcing. In the present day, the amount of 3D printing, cutting and designing workshops is rapidly growing. One can say, present time has so much to offer to a luthier. The vital part is to include these technologies to production.

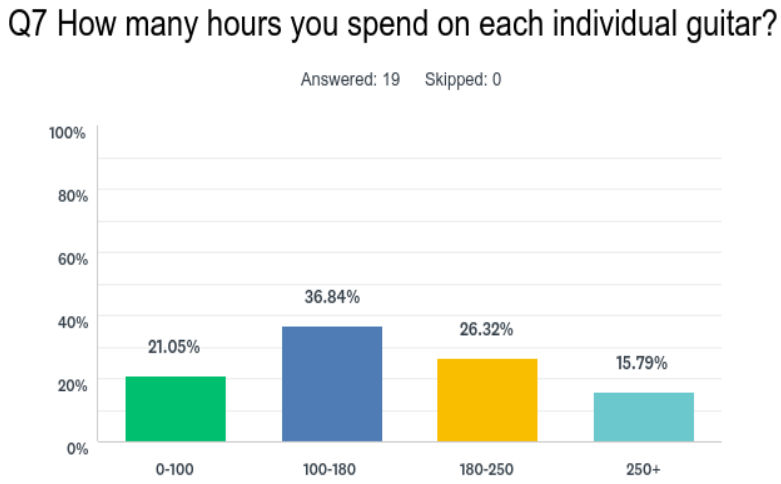


Figure 2.2: Individual Guitar Making Business Optimization Luthier Survey Question 7

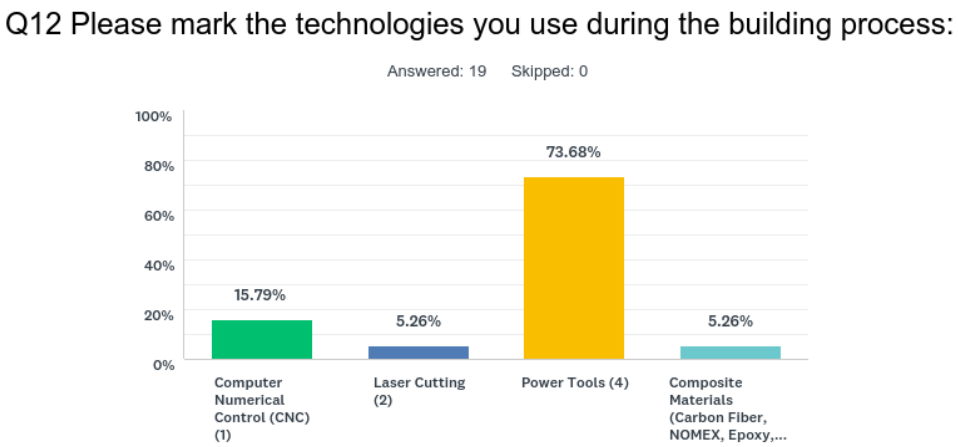


Figure 2.3: Individual Guitar Making Business Optimization Luthier Survey Question 12

2.2 Stock management

This section of the thesis will identify the fundamental raw materials needed to be in stock in order to apply WIP-KANBAN system based utilized business model. For that, section will explain the approach on material acquisition from lutherie point of view and use survey responds of luthiers to establish related and differentiated factors of requirements between lutherie and mass production. With the data collected and analyzed, the study will develop an innovative approach towards utilization for lutherie production system.

2.2.1 Resource descriptions

The amounts, types and quantities of the resources used in mass produced and handmade guitars vastly differ from one to another. Mass production needs sustainability, affordability and easy process ability in the material to proceed with the production line. Concerning a production line produces a large quantity of guitars, material acquisitions for the operation needs to be rapid and sustainable.

The most essential aspect of instrument making is wood selection. To build a successful instrument, one requires wood dried and preserved in right conditions, dimensioned and cut in the right grain structure. Whilst mass production prefers local wood which can transferred rapidly in large quantities for an affordable price, lutherie has a more flexible approach towards the matter. Survey directed to luthiers indicates 84% of participants spends and average of 2000€'s annually to make additions for their wood stock in order to maintain and sustain a high-end wood options for their instruments (Figure 2.4). For an individual instrument builder,

stocking a certain amount of high quality wood and preserving it for the long term; is an approachable action due to the reduction in the quantities of wood in comparison with mass production.

Figure 2.4: Individual Guitar Making Business Optimization Luthier Survey Question 11

Suppliers who will supply for the tool, lacquer (polish), hardware, glue and adhesive needs to be chosen by the factory executives in order to provide a cheap, functioning, sustainable and distributable inventory for the production line. Other organic materials such as bone and ivory for the nut and saddle, are really rare to find and use in a regular basis. That's why mass production lines prefer inorganic material for these parts such as plastic, graphite and such composite materials. But considering luthier has the advantage of the low annual production quantities, the amounts of purchasing will be cheap and fast in a logistical point of view.

2.2.2 Requirement differences

As a result of producing and distributing in high-volumes, mass production requires sustainability of raw material in order to keep producing in the same volume and precision. This is why choice of the material should be easy to purchase, receive and process. Mass production brands generally use local woods preferably from the area of base of operations or in the country-wide. It simplifies to deal with the customs and commerce regulations. When purchasing a stock of wood for a factory (Figure 2.5), executives analyze the stock on both sustainability and regulation ends.

A luthier on the other hand, is highly flexible to search for the desired best quality wood no matter the amount and type. Unless the individual orders a factory size stock, it's much more easy to import a certain amount of highly exotic and qualified wood to his/her own collection. Whilst a stock of a certain type of wood for 60 guitars means so less to a mass production executive, due to the differences in

volumes, a stock of one type of wood for 60 guitars might cover the need of the luthier for his/her lifetime.

It brings up to concept of sustainability. Unlike production line, lutherie doesn't need a fully sustainable raw material transfer on regular basis. As long as he/she maintains the fundamental material requirements intact, a luthier will always have a collection of high-end woods in his/her stock.

Figure 2.5: Gibson Guitar Corporation Memphis Factory , (James, 2014)

2.3 Innovative approach

Lutherie can use some of mass production's techniques and approaches without the burden of big volumes, regulations or sales target. Stocking the wood that required to operate a functioning workshop is the primary objective for the luthier. Considering the volume of this stock will be small comparing an active factory's reserves, builder can purchase, stock and use any type of wood in order to serve his/her desired guitar's design. This allows builder to go extremes tonally and esthetically. With the preferred wood choice, Luthier can outsource the heavy manual labor to firms with the machinery already installed in their inventory, instead of spending time on labor or using the capital investment on industrial level machinery to cut and shape the wood.

Outsourcing the heavy machinery lets Luthier to design a more elaborate environment for building a custom, high end guitar. Without the contamination, and energy consumption of industrial machinery, one can build his/her instruments in a more stabilized platform which will affect the finishing qualities and design concentration. Having the wood stock pre-dimensioned before in workshop processing, is beneficial for both drying the wood and using jigs and templates as mentioned in previous sections, for a higher precision of woodworking. Without the heavy responsibilities of running a mass production factory, Luthier can invest in

research and development, tooling and designing more efficiently. Which affects the tonal and structural progress of the guitar.

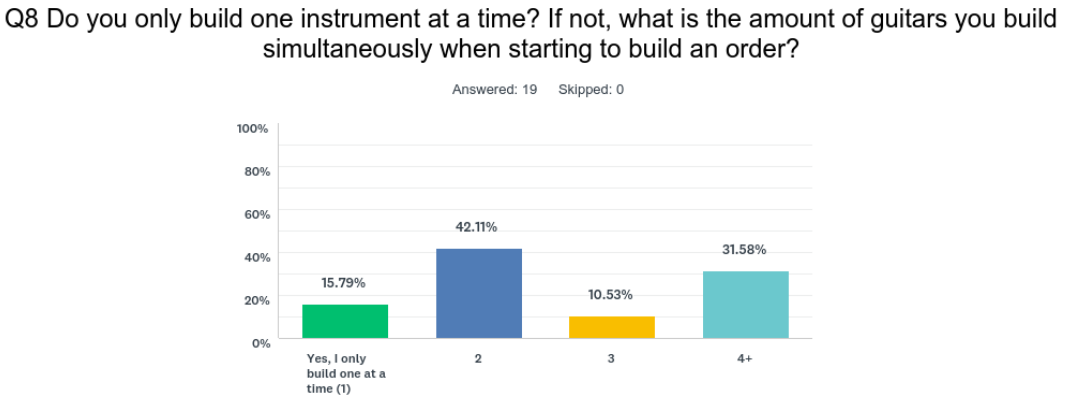


Figure 2.6: Individual Guitar Making Business Optimization Luthier Survey

With these technology, data, and the methodology of WIP-KANBAN; building one instrument at a time will be a loss of time. Based on the data in the hand provided by the surveys, an average of 42% of luthier participants starts to build 2 guitars at a time while 15% still builds 1 guitar(Figure2.6). And yet 84% of all luthier participants monthly operational expenses is around 2000€'s (Figure 2.7).

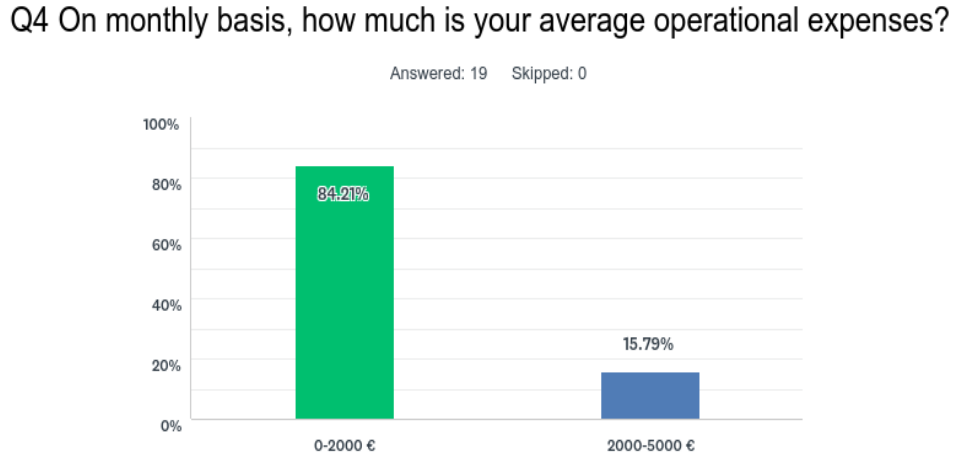


Figure 2.7: Individual Guitar Making Business Optimization Luthier Survey Question 4

This means both profiles are sustaining with the production turnout annually. Considering more than 50% of these participants spends averagely 180 hours to build one instrument with mainly using power tool technology, addition of recent

technology and reduction of labor will enable luthier to increase production quantities without increasing workhours. Instead of starting to build 1 for 15% and 2 for 42% as the survey indicates, luthier can increase these quantities more than 50% by simply using the technology to utilize the production line and identifying the WIP limits. This means to categorize the phases of making the instrument (Figure 2.8) and order these phases to utilize producing 50% more fundamental parts to maintain enough resources for not the actual annual quantities, but to produce an extra product in every WIP session which survey states by a majority of 2 guitars in 180 hours.

Based on the fact that 63% percent of the luthier participants builds 10 guitars annually, utilization will increase this number up to 15 guitars annually at the least without tempering average workhours spent on the workbench. WIP-KANBAN suggests no extra parts or products without the demand, order or target. In order to function this methodology, what luthier needs to achieve is to increase the demand by multiple factors of management, advertisement and promotion which will be covered in further sections of the study.

Another emphasizing needs to be done on Mean Leading Time (MLT) which is basically is the sum of the total amount of time from the beginning of order, WIP, and delivery to the player. These time conceptions will differ from maker to maker but to set an example based on the data provided by the survey, Luthier needs to require another extra average 180 hours, which totally stands for 360 hours to deliver. This is not reasoning to work without the stress, this is mainly crucial due to the multi-production utilization and risk factors on both technical or financial ends. Creating a waiting process will both function for collaborations with third party sellers and also increases the image of the demand from other parties. With the utilization and new demands created by the luthier him/herself, the production line of the workshop and the demand for the instruments will create a loop with regular revenue and sustainable sales.

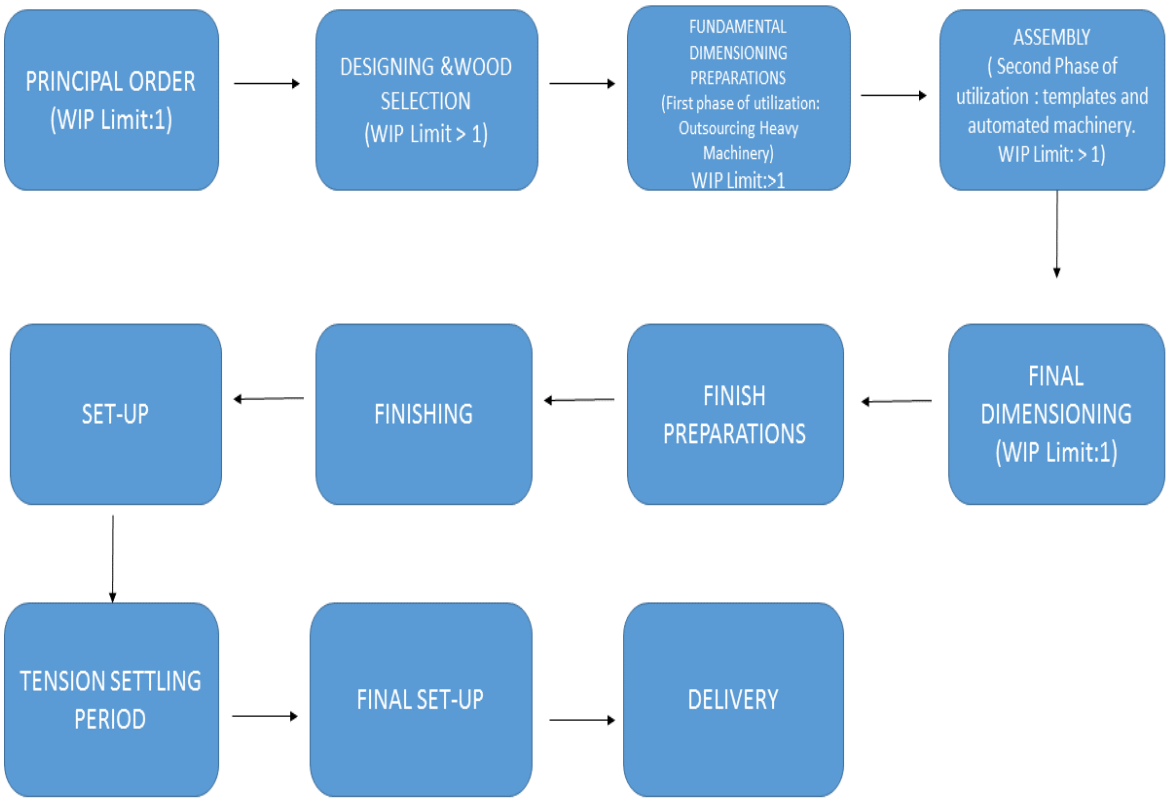


Figure 2.8: Luthier WIP Model Sample

3. BUSINESS

Commercial guitar manufacturing began in U.S in the early nineteenth century. The firms were small shops with few employees. Guitar output grew in a fairly steady fashion until the early 1960's when it rapidly accelerated (Waller, 1968).

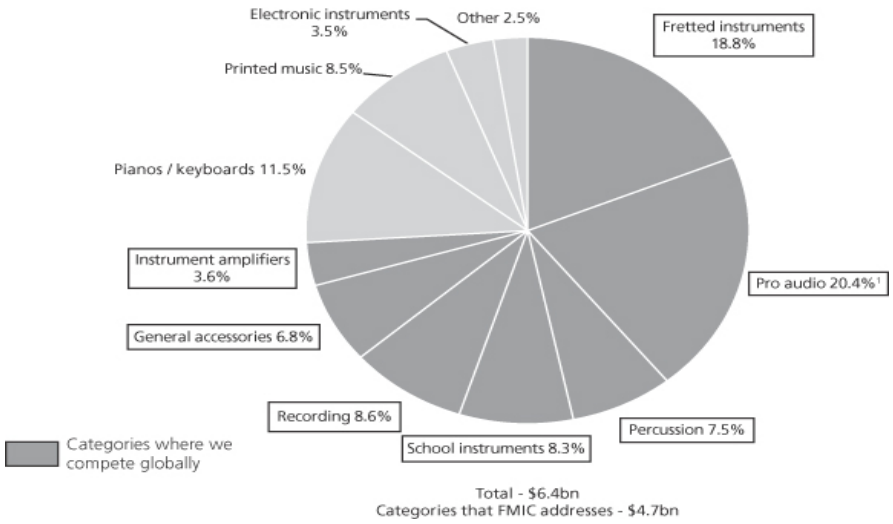
> Musical instruments and accessories industry is approximately generating 15.8 billion U.S dollars of global retail sales and 6.4 billion of U.S retail sales today according to industry analysts. To the same source, 4.7 billion of the 6.4 billion dollars in the retail sales in U.S, belongs to fretted instruments, amplifiers and general accessories (Table 3.1) . (Fender Musical Instruments Corporation, 2012)

In spite of the unstable market equilibrium, guitar industry is gradually expanding on retail market end. The popularity of the guitar-based music in present day originates from both visual trends and also the ease of accessibility economically. These aspects indulge individuals to create music, content that will attract audiences. Having long-term trends that mentioned above, stabilize the demand to guitar. Which means no matter the retail market's situation is economically, there will always be someone who is in requirement of a guitar.

This is a factor that the luthier should be taking advantage of. Regarding no risk factors of the global retail market, an individual maker can optimize retail industry's intersecting advantages such as creating demand, exposition of products and collaboration with third parties to build, distribute and promote his/her instruments globally. Despite these two markets separated from each other through the market gross, instrument diversities and production approaches, Lutherie can adapt some of its techniques and methodologies to produce, promote, and sell instruments with better precision and stabilization.

Business section of the thesis will analyze the approach of mass production with its advantages and risks. With the data gathered, the work will designate optimization fundamentals for Lutherie and its necessary components.

Table 3.1: U.S. retail sales by product type in 2010 (Fender Musical Instruments Corporation, 2012)



3.1 Finance & management

Financing and managing an individual workshop and a mass production brand are two very different things. In Lutherie, the builder acts as manager, laborer, promoter, investor and the face of the operation individually. This idea is supported by the Luthiers who participated in the survey by stating that 84% of the participants manage their own finance and business aspects entirely by themselves (Figure3.1). But in mass production, all the topics mentioned above are being dealt with specific departments run by corporate professionals. The section will analyze mass production mainly to extract optimization patterns for an individual workshop.

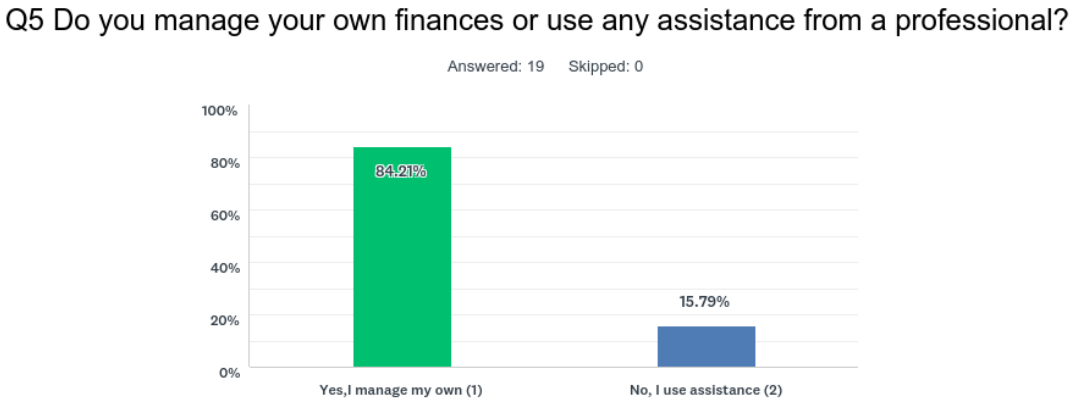


Figure 3.1: Individual Guitar Making Business Optimization Luthier Survey Question 5

Unlike Lutherie, mass guitar production eliminates individuality entirely. Instead of one individual multi-tasking with every aspect, big brands consist of a board committee and executives who supervise the operation in general. This is where production and management dissociates. Production line and its executives only deal with the product in line, which is the design the board approves.

The business model mass production uses formed to build a specific design and distribute it globally to third-party dealers (Figure 3.2) who will bring together the clientele and the product. Automatically it makes dealers are the biggest clients of the brand. With the amount of the capital the brand has, it's possible to acquire other relatively "small brands" to be incorporated in order to enlarge product spectrum. Because of the wide range of products, it is essential for the corporation to keep bottom prices reachable for public in order to turn the product line into money. This is the main factor of having the staff of a CEO, a CFO and sub-officials for managing the cash flow, calculating the risks and act accordingly in order for the brand to sustain.

Figure 3.2: The guitar showroom at the new Guitar Center Block at Orange store in Orange, California. (Clyne, 2011)

3.2 Risk factors

Mass retail market relies on economic welfare. Sales of musical instruments depend in significant part on discretionary consumer spending, which tends to decline during economic conditions. Discretionary consumer spending also is affected by other factors, including changes in tax rates and tax credits.For instance, the current financial crisis in Europe

> (including concerns that certain European countries may default in payments due on their national debt) and the resulting economic uncertainty has adversely affected and may continue to adversely affect product sales in Europe. To the extent that these adverse economic conditions in Europe continue or worsen, demand for musical instruments by both consumer and retailers may decline, which can significantly harm the business and results of operations. (Fender Musical Instruments Corporation, 2012)

With the unstable market and without a proper WIP planning, mass production needs to accurately forecast the demand for its products. If the produced amount of products doesn't meet the demand or exceeds it, the revenue model won't work as its planned. Guitar retail market is massive. In order to take place in competition and increase the demand for the products, mass production needs to anticipate and respond to changes in consumer demand and trends. Having any delay in the delivery of products will affect the sales and operations deeply. One of the reasons for that risk is the mass production works with OEMs, which logistically and operationally should be preserved constantly. Any disruption experienced at manufacturing facilities, distribution systems or OEMs can affect the delivery of the product to consumers.

> As mentioned in previous sections, the supply of raw materials and components manufactured by the brand or third parties (OEM), should be sustained and thoroughly organized in order to maintain production line intact. During the raw material acquisition, a mass production brand needs to follow the bylaws and regulations relating to the importation and use of certain raw material. This topic is vital for mass production as a consequence of having a large inventory of raw material imported in reserves. Because when regulations are not met by the brand, there is a big possibility of facing confiscation of the stocked material. Mass production mainly uses dealers, and third party international sellers in order to reach out to the consumer. This means a factory's biggest client is not a performer or a collector, but a corporation with its own business model. This is both beneficiary and risky. Because no matter these third party corporations dominates the market, there is always a possibility of an unexpected bankruptcy. If a scenario like this occurs, the firm won't be losing an individual client, but a source of high volume orders which is responsible for a big percentage of annual sales. (Fender Musical Instruments Corporation, 2012)

3.3 Marketing & distribution

To create the demand for the extra finished products which provided by the developed production system mentioned in the previous chapter, luthier needs to replicate and take advantage of some of mass production marketing approach. This section will review the channels of sales and distribution, marketing methods. With the extracted data of intersecting elements, the study will adapt these business and marketing elements to lutherie with case studies of events and third parties given as examples.

3.3.1 Sales channels and distribution

Mass production primarily sells its products through five sales channels. These are independent, national, mass merchant, online and distributor channels. It can be observed no matter these channels function differently one to another, prime focus of the methodology is based on finished product delivered to a third party, whose specialty is to gather clientele to promote and sell the guitar in an environment specifically for trading musical instruments. The survey indicates that 34% of professional guitar players who participated, are not aware of any high-end guitar dealers of any kind (Figure3.3). This means there is need to identify and explain all these sales channels in order to observe any kind of deficits between the demand and exposure to the product. For that, thesis will overview these channels separately with specimens.

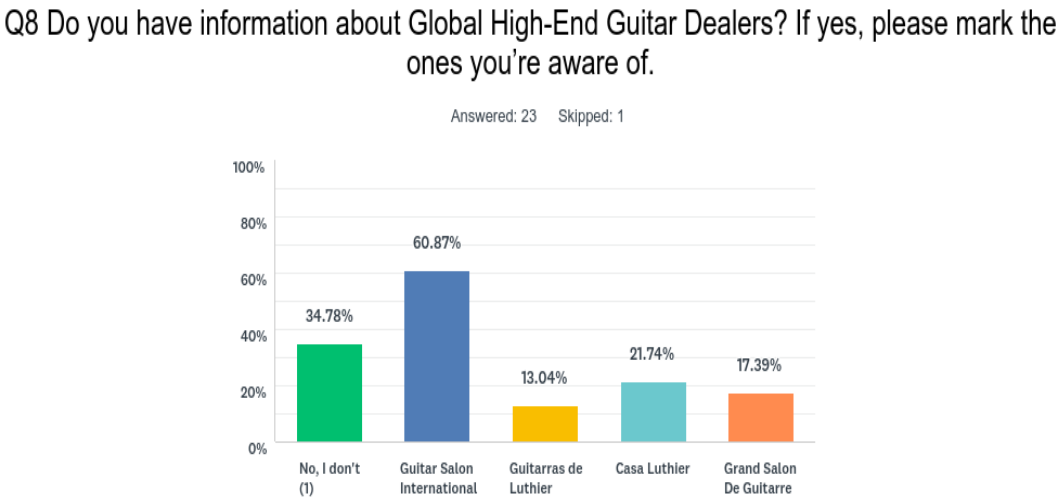


Figure 3.3: Individual Guitar Making Business Optimization Guitarist Survey Question 8

3.3.1.1 Independent channel

The independent channel is comprised of independently owned music stores that typically offer guarantee and personalized customer service. These stores are chosen by the brand, based on location, expertise, commitment to the product line, financial integrity and clientele. It is the most common sales channel of the industry especially for Northern America and Europe regions.

Kıvılcım Music for instance, is a musical instrument retailer based in Tünel, Beyoğlu (Figure 3.4). Their main focus of the firm is to promote and sell their wide range of products in certain brands such as Fender, Esteve, Martin, Roland. Like mentioned above, Kıvılcım offers clients official guarantees, maintenance and solutions for disputes such as distortions caused not by the consumer but production or distribution.

Figure 3.4: Kıvılcım Müzik Store Beyoğlu, İstanbul

3.3.1.2 National channel

The national channel is comprised of large, multi-unit musical instrument retailers such as Guitar Center and Sam Ash, who have nationwide store networks. These stores offer a variety of products, providing consumers the opportunity to view large portions of certain product lines, and must maintain an agreed-upon inventory of products. The national channel is one of the largest channels in North America, and is a relatively smaller channel for international operations. Some of the national channel retailers are also authorized to sell the products on their websites. Contracts made with national retailers are typically short term, can be terminated by either party on short notice and do not obligate the retailer to purchase fixed amounts of our products. (Fender Musical Instruments Corporation, 2012)

One of the best examples to a known retailer is Guitar Center, which is a home to one of the world's largest selection of popular guitars, basses, amplifiers, keyboards, workstations, drums, percussion, microphones, PA systems, DJ equipment, stage lighting, recording software, studio gear and more. Backed by over 260 stores across the U.S, GuitarCenter.com offers the fastest, easiest way to find all the gear needed in one place. And, while many popular instruments are available for same-day pickup at a store near-by, they also offer free shipping on thousands of items to the Guitar Center location of your choice.

3.3.1.3 Mass merchant channel

The mass merchant channel is comprised of large-format, multi-unit stores that purchases products from the manufacturer and then resell these products to consumers. Mass merchant stores offer manufacturer the access to parts of the general population that typically do not visit traditional music stores. Manufacturer generally offers entry-level products that are branded solely for the mass merchant stores in this channel, which helps to introduce the brand to a potentially wider base of consumers.

"Costco was our most significant mass merchant customer in fiscal 2011. " (Fender Musical Instruments Corporation, 2012)

3.3.1.4 Online and catalog channel

Brands features their certain products in both the online and catalog companies of most of these retailers and often present their products on the homepage or front cover space resulting in nationwide exposure to consumers who seek out products in these channels. In addition to these third-party sites, some of the independent retailers mentioned above also in possession of websites for selling the certain product online.

> Such as Musician's Friend, which was founded in 1983 by Rob and DeAnna Eastman. Founded in 1983, Musician's Friend has grown rapidly to become the world's largest direct marketer of music gear. Their vision is to give musicians the best prices and selection available, along with superior service to help musicians achieve their goals in music. Musician's Friend prides itself on having a topflight customer service staff who live and breathe the products they sell. Today they have multiple locations around the U.S. to provide quick delivery and excellent customer service. Corporate headquarters is based in sunny Westlake Village, CA., with two support centers reside in Salt Lake City, Utah and Indianapolis, and a 700,000 ft. distribution center in Kansas City, MO. (Schlegel, 2008)

3.3.1.5 Distributor channel

Distributors are one of the most common channels of the guitar retail market. They are the biggest clients of certain brands due to their ordering frequencies. Mass production brands sell their products primarily through distributors who in turn, sell to retailers within their authorized distribution area. Some of these distributors are the sole distributor of the specified products and others are one of several non- exclusive distributors within their territory. This model provides significant control in global sales market.

Therefore, mass production brands continually monitor the markets in which they operate, and, when a brand believe a market opportunity to be of appropriate size, they evaluate whether to establish their own direct sales operations within that market. Contracts made with distributors generally prohibit them from selling competing products other than certain competing products authorized by the brand. The distribution agreements are generally short term, typically with durations of one year or less and terminable by either party on short notice. In fiscal 2011, Fender Musical Instruments Corporation generated 58.7% of its gross sales before discounts and allowances from the independent channel, 23.5% collectively from the national channel, mass merchants and online and catalog retailers and 17.8% from third party distributors. (Fender Musical Instruments Corporation, 2012)

One of the best known distributors in Turkey is 4C Muzik founded in 1985; is the official distributor of well-known retail brands such as Cort, D'addario, Valencia, and Ibanez. Having a showroom, a 4000m2 warehouse and a built-in maintenance unit, 4C offers technical and logistics support to its retailers and individual customers.

3.3.2 Marketing & promotion

Marketing and advertising programs of mass production companies are focused on enhancing relationships with consumer. By increasing the exposure of core brands to the population in general and reinforcing the positive lifestyle appeal of the specified brands, companies implement marketing and advertising programs relating to their specialty and niche brands targeted towards musicians active in the genres with which those brands are identified. Marketing and advertising campaigns cover a wide variety of activities, including the endorsements, licensing and co-branding efforts, media advertising, websites and other social media and consumer activation activities, such as hosting after-hours parties in music festivals featuring bands and artists playing company products. Mass production companies also conduct various promotions in cooperation with their retailers, including artist appearances, product education clinics and other special events.

Marketing departments provide point-of-purchase advertising materials, display and merchandising fixtures and other materials designed to highlight company products at the retail and exposition level. On the other hand, it can be observed from the luthier responds of the survey that only majority of the responses is in social media by 94%, while event and exposition attendances is approximately 50% (Figure 3.5).

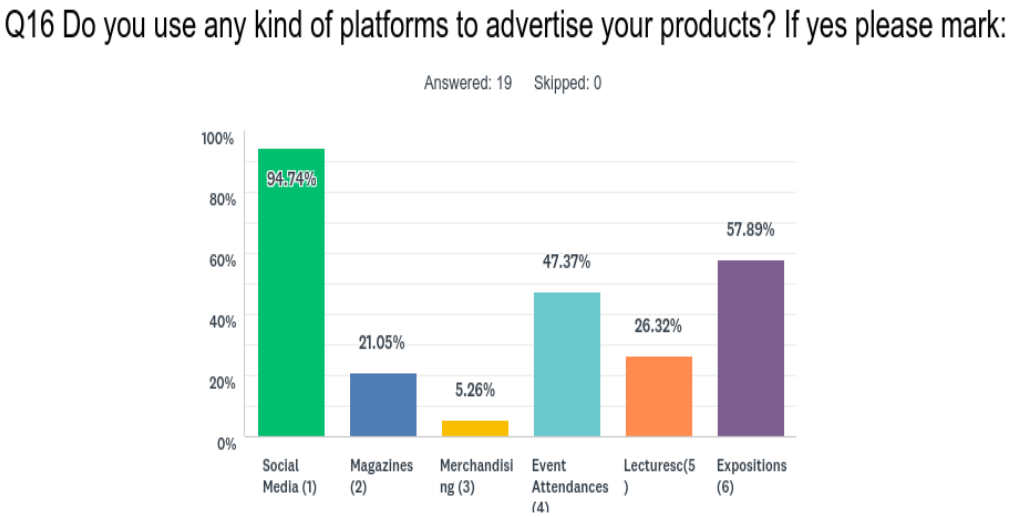


Figure 3.5: Individual Guitar Making Business Optimization Luthier Survey Question 16

One of the most efficient devices for mass guitar manufacturers is expositions. Expositions gives exhibitors the opportunity to reach out to the focus group, advertise the latest models of the product line and expose population to the branding campaign. Simultaneously, expositions give visitors the chance to test new products, to see and hear well-known artists at workshops and product demonstrations and to attend numerous concerts, autograph sessions, events, awards ceremonies. The broad spectrum of events for trade and private visitors, as well as retailers and distributors, is rounded off by seminars and workshops, which provide a solid basis for regional, national or international networking. (Figure 3.6)

Figure 3.6: the NAMM Show 2017, California (NATIONAL ASSOCIATION of MUSIC MERCHANTS INC. US, 2017)

Endorsement is a key component for a marketing strategy. Through this component, musicians across a variety of popular music styles provide specifications for unique instruments bearing their signatures and signs a contract with the brand to use their images in selected advertisements or on their websites, typically in exchange for royalties based on sales of their signature instruments. Some artists also attend tradeshows to help market specific products. In addition, artists play their signature instruments at concerts and personal appearances, adding to the exposure of the products in live music venues.

These musicians also mention their support of the brands in interviews, and are often seen with brands in print publications where album or performance reviews include photographs of these artists and their instruments during performances. By associating company brands with these artists, brand enhances how its consumers perceive it. Although endorsement collaborations beneath luthiers and players are something occurring for years, survey indicates 79% of the luthier participants who are averagely 50 years old by 63% (Figure 3.7), are not using any kind of endorsements (Figure 3.8).

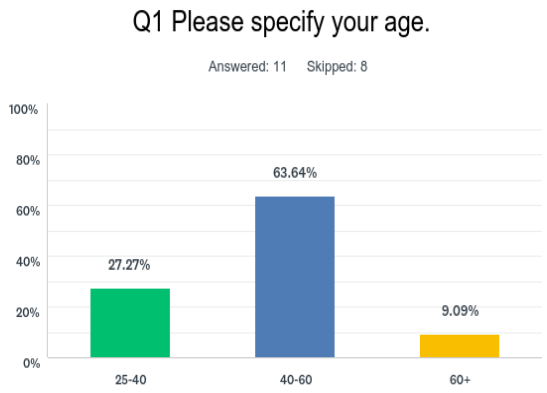


Figure 3.7: Individual Guitar Making Business Optimization Luthier Survey Question 1

In an effort to expand awareness of the product to target audiences and the population in general, mass manufacture brands also conduct advertising campaigns. They maintain a staff dedicated to product placement and advertising campaign creation. These activities include purchasing ads in trade and broader interest publications, submitting products for reviews by various publications, as well as product placements in movies and television shows that contribute to awareness of company brands in an audience that may not necessarily be familiar with its core products.

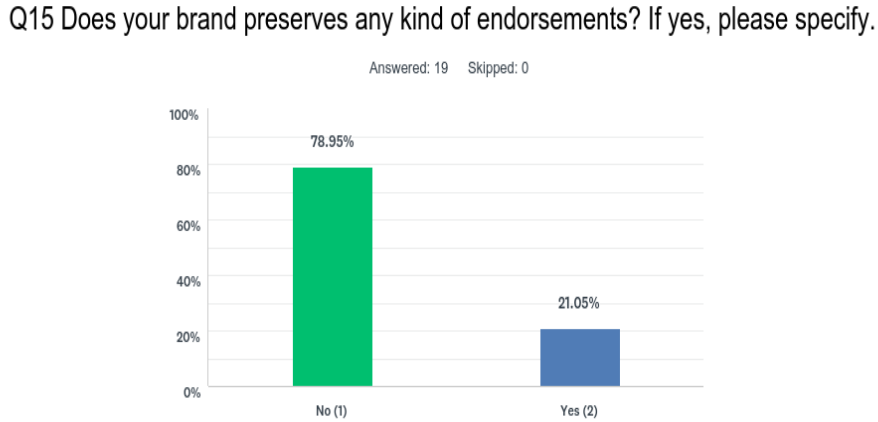


Figure 3.8: Individual Guitar Making Business Optimization Luthier Survey Question 15

In addition to traditional print media, companies maintain active social media platforms to help expose their products, service, support and community forums to consumers as well as various artists to foster loyalty and build a community of users who share a passion for guitars and other products. Many of the websites feature a community forum section where

> consumers and others can communicate with each other, including sharing tips and anecdotes. The community forum section and social media also allow the firm to communicate directly with consumer base and receive feedback directly from the consumers. Websites feature product pages where consumers can research and investigate the products and where they will find extensive product information, specifications, dealer locations and other important details about products. (Fender Musical Instruments Corporation, 2012)

3.4 Optimization of intersecting aspects

Unlike mass production, lutherie is a discipline of individuality. As stated in previous chapters, the builder basically is responsible for every component from fundamental production, know-how to taxation regulations. In order to clarify, it is really a challenging task to simultaneously manage, produce, design, promote an individual brand with specific products and provide constant collaboration with clientele to expand the sectoral network and offer maintenance. For decades, challenge of running a successful custom guitar brand struggled to reach its full potential reasoned by the large variety of components needs to be expertized and applied instantly. Fortunately, present day's conditions beg differ. In spite of having vastly different approaches towards the subject, mass guitar production and custom guitar making intersects on various points. Apart from the adaptation of production techniques as explained in the related chapter, lutherie can optimize a lot from mass production's marketing and distributing models in order to design a more effective way of organizing the business as a whole.

With the increase of technology's involvement, the progress of custom guitar making and especially its market, accelerated. The speed of global information sharing led Luthiers to create their own international community of builders and also performers resulting a bigger, more competitive and more elaborate market. In order to establish a successful custom guitar brand in an elaborate market, the product by itself will not be sufficient without business components developed.

3.4.1 Sales channels & distribution

Enthusiasm for custom guitars by collectors, performers and hobbyists is an international factor. Survey directed to professional guitar players indicated that 62% of the participants spends averagely 3250€ to purchasing new guitars in every 5 years (Figure 3.9). And at the same time, 58% of the participants prefers to buy their instruments from a shop (Figure 3.10). Which means there will be independent dealers who operates in a shop or an online platform to see the deficiency of meeting the demand and intent to make benefit from it.

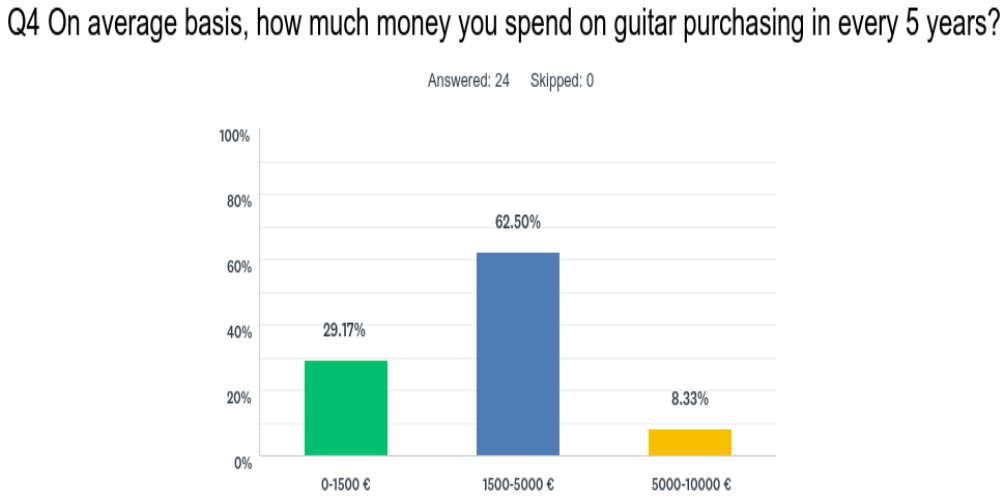


Figure 3.9: Individual Guitar Making Business Optimization Guitarist Survey Question 4

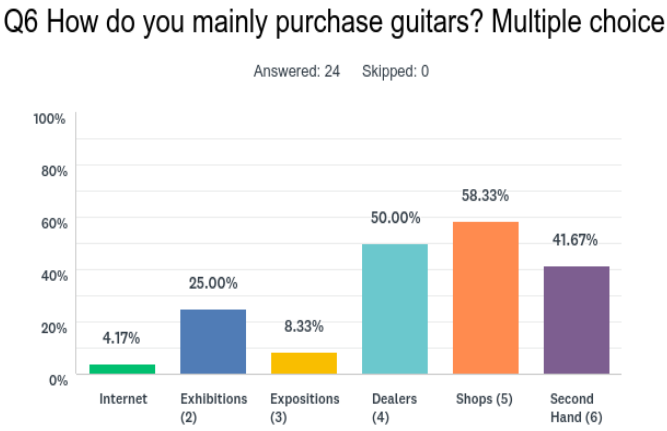


Figure 3.10: Individual Guitar Making Business Optimization Guitarist Survey Question 6

Like retail market, custom guitar market also has its own independent dealers all over the world. Nevertheless, luthiers survey shows that only 26% of the participants making the approach to get connected to these third parties (Figure 3.11). This indicates that the extra demand for the extra WIP can be generated by collaborating with these third parties. As mentioned in the previous chapter, this optimization includes to increase production quantities without tempering recognized worktime and create alternative channels of demand other than individual efforts. While these third parties are already promoting and distributing the instrument made by the luthier or taking new orders, all maker needs to organize is to reserve a particular number of instruments in WIP limits in annual production schedule to meet the extra

demand other than regular annual orders. This kind of arrangements made between the luthier and the dealer will be more beneficiary for the luthier than the dealer as dealer takes a lots of promotional, sales and logistics burden off from luthier's shoulders and also having multiple collaborations with these third parties can will provide luthier a pre-booked full year functioning WIP planning.

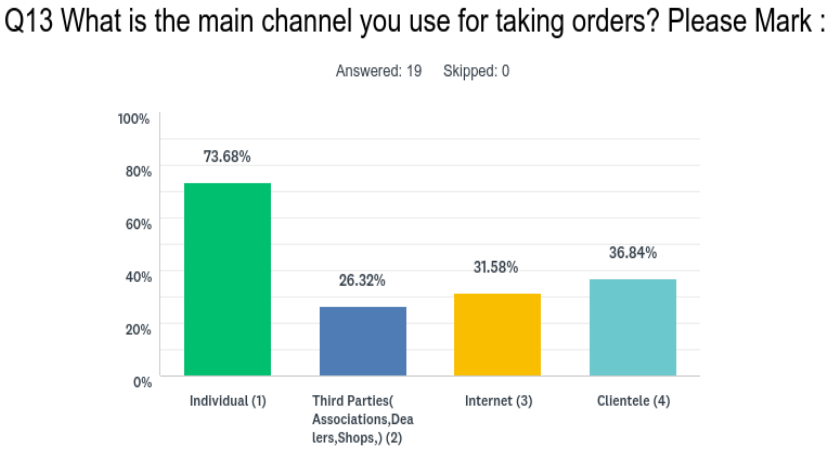


Figure 3.11: Individual Guitar Making Business Optimization Luthier Survey Question 13

As an example to these third parties, over the course of 30 years, Guitar Salon International (GSI) has become the world's largest dealer of fine classical and flamenco guitars. Their primary mission at GSI has always been to promote the guitar around the world by whatever means possible. By building close relationships with both the makers and players of these instruments, and always maintaining a profound respect for the art, GSI has been able to serve students, professionals, collectors and aficionados alike. They have evaluated, acquired and sold the largest number of vintage instruments from the most desirable makers of history, and have subsequently assembled some of the most important private collections in the world(Figure 3.12). (Gonzalez, 2017)

Figure 3.12: Scott Tennant recording session in Guitar Salon International Headquarters, California (Gonzalez, 2017)

3.4.2 Marketing & promotion

Like mass production brands, Luthier needs to address the population of guitar enthusiasts in big volumes and promote their instruments. Guitarist survey states that only 75% of the participants around the world, are aware of one global event mutually (Figure 3.13). At the same time there is a 25% of participants are not aware any kind of global events at all. This pattern only can be done through expositions, festivals, artists, special events and lectures generated by the growing number of international associations who focuses on custom guitar's making, performing, commerce and education. Reasoning these events will increase credibility and appreciation towards luthier's currents stance as a brand and also expose the consumers to his/her instruments both visually and musically. And yet, luthier survey indicates 78% of the participants are not using any kind of endorsements (Figure 3.14) and only 57% of them are attending expositions despite 85% of the luthiers who participated are aware of at least one global event (Figures 3.15,3.16).

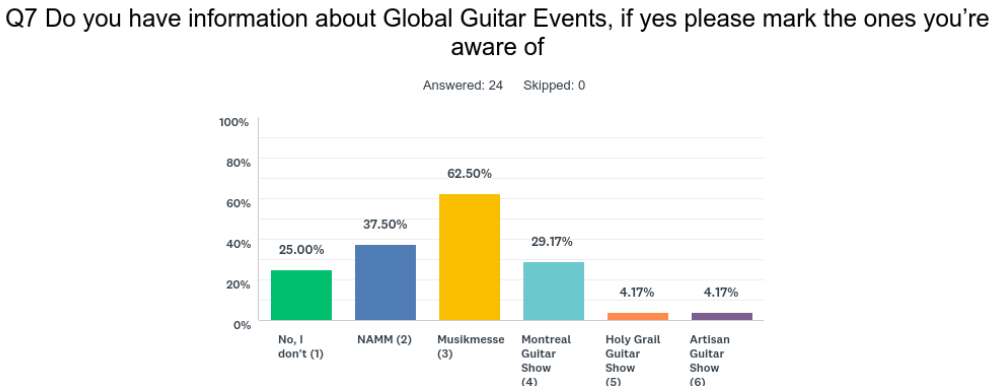


Figure 3.13: Individual Guitar Making Business Optimization Guitarist Survey Question 7

Two essential components for custom guitar marketing are endorsements and expositions. Through endorsement, maker meets the creative and practical needs of professional musicians who in return, offers tools of recognition amongst the market such as, promotional appearances, on stage exposure of the specific instrument and so on. So it makes perfect sense that players and builders would join forces through product endorsements where the Luthier provides discounted instrument and the service to keep it in high performance, and the players demonstrate the potential of the guitar in their music. Ideally, an endorsement raises the profile of both the player's career and the brand through not only concerts and CDs, but advertising, performances at trade shows and clinics, online links and media, and other types of promotion. (Rodgers, 2009)

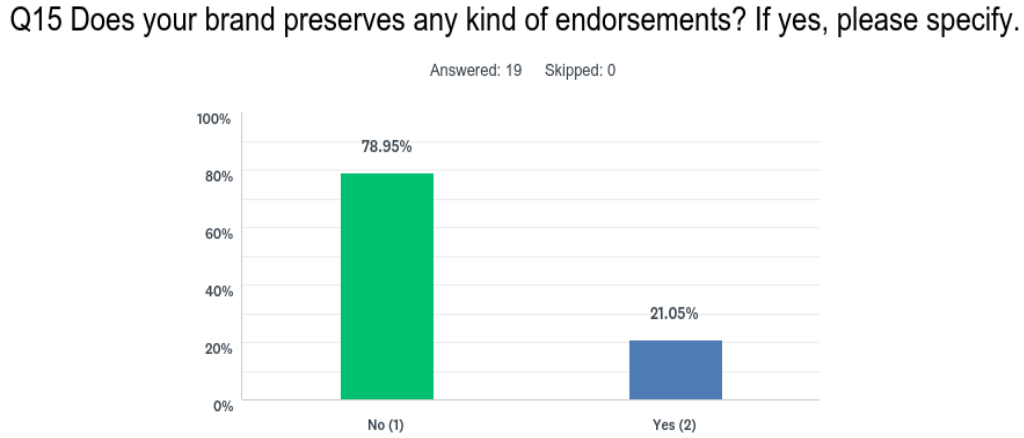


Figure 3.14: Individual Guitar Making Business Optimization Luthier Survey Question 15

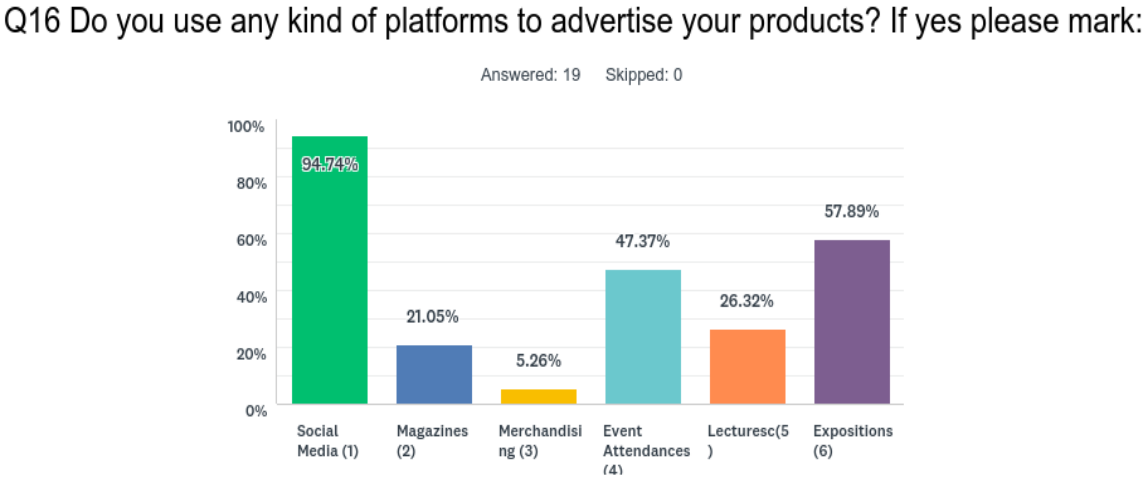


Figure 3.15: Individual Guitar Making Business Optimization Luthier Survey Question 16

Custom guitar expositions are the biggest platforms that contains both a big variety of makers internationally and consumers who are interested in getting information about the instrument and if the instrument fits, purchasing it. There are expositions which contains both retail and custom brands altogether which also should be taken advantage of. But also, there are expositions and show hosted by luthier guilds and international guitar associations.

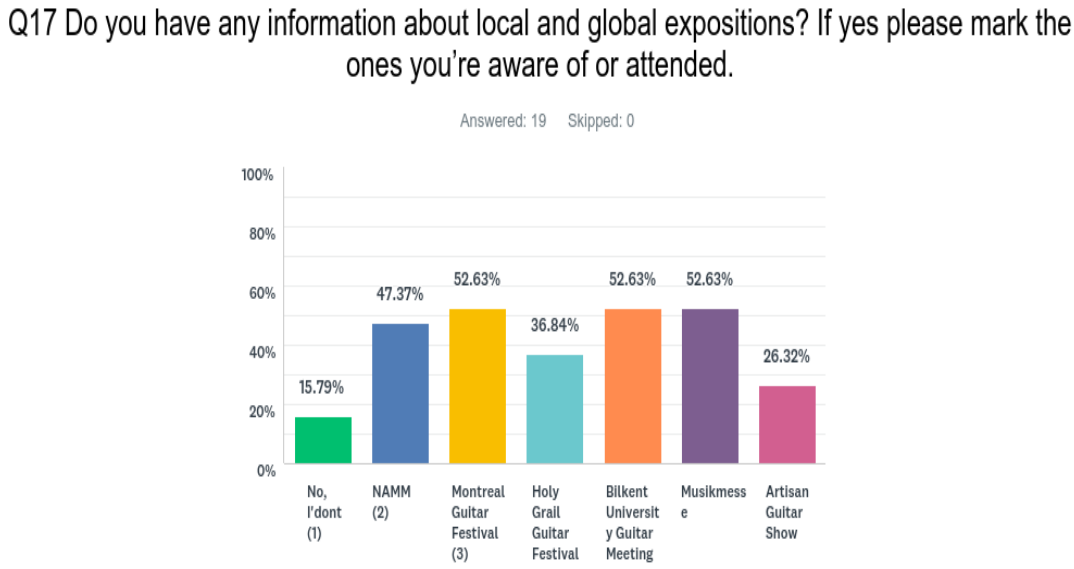


Figure 3.16: Individual Guitar Making Business Optimization Luthier Survey Question 17

Holy Grail Guitar Show for example (Figure 3.17), hosted by EGB (European Guitar Builders), presents instruments range from expensive and exclusive guitars and basses by today's foremost builders to rugged working musician's tools, designed for daily use on the stage or on the road. Spanning the gamut from historically inspired and classically constructed guitars to fanciful inventions embracing new technologies and approaches, the Show promises to yield something for even the most discerning visitor. The concept for the show drew its focus from the intention to provide the best possible setting for the presentation and promotion of the handmade guitar. The creation of a community of luthiers spanning borders across Europe, as well as retaining the artisanal character of the show.

Figure 3.17 Holy Grail Guitar Show 2014, Berlin (European Guitar Builders, 2014)

4. CONCLUSION

As a result of this work, it has been deducted that mass retail market and manufacturers of the guitar are rapidly progressing on production, distribution and marketing ends. The work also indicated that getting into competition with the mass retail market won't be beneficiary for the individual maker reasoned by these two markets are actually separate in production and management mentalities. But it doesn't mean that a successful business model can be adapted to this niche market.

4.1 Production summary

With the present accessibility to the technology for production, individuals can stock repetitive fundamental components of the guitar in slightly bigger volumes which enables WIP-KANBAN methodology applicable to the production end. These technologies also let luthier to outsource certain production processes and elements such as dimensioning, cutting in large numbers, CNC aided woodworking which enables building a bare minimum of 50% more than the initial production quantities. This means a luthier can reduce his/her labor costs, worktimes, collaterals for the material and increase precision, WIP efficiency and make space in WIP schedule to seek new demands for the newly added products.

4.2 Management summary

In present day lutherie, an artisanal craft which has been practicing since the Baroque Age, has become an international niche market for its respected practitioners. With the technological advancements in production and analyzing commercial marketing techniques, luthier is able to have the capability to increase the production efficiency and reach out not just local consumers, but can widen his/her range of clientele globally. The surveys conducted for the thesis indicated that there is supply and demand in the market which means there are individuals who builds and sells high quality instruments and there are individuals who are in pursuit of these instruments on regular basis. But also they indicated there is a deficiency of communication and information beneath both players and luthiers. This deficit of data flow causes a regression directly effects the variety, progress, revenue channels and sustainability of the market. To evade this scenario, luthier primarily needs to collaborate with

other luthiers and players regularly on communication and networking basis. Apart from that, collaborating with third party professionals and exposing instruments to the consumer via various events, associations and foundations will provide the requested demand for the new increased production quantities of guitars which the WIP-KANBAN optimization will enable. With the assistance of these third parties and associations, the demand for the instruments will be constant due to the new channels of sales and distribution which sustain the production, establishment and the individual on capital, management and revenue basis.

4.3 Business summary

After utilizing the production line, luthier needs generate demand for the instrument that built without an order but with the production methodology itself. Considering a luthier is already in communication with the clientele who visits the workshop, what he/she needs to achieve is to use marketing components explained in the related sections such as exposition appearances, endorsements deals, electronic advertising and agreements made with both in-shop and online dealers.

Due to the 50% increased production quantities implemented by the utilization of WIP methodology, luthier can get into collaboration with more than one channel. Having multiple agreements and demands with these third parties added to luthier's annual production line, an individual can use his/her working hours fully booked and organized constantly without individually seek for new clients. This will provide a stable and sustainable revenue and ability to compensate fixed costs of running the business.

The core idea of this thesis is to project an exemplary business model approach for individuals whom is interested in the discipline of lutherie professionally. The referred business model will aid individuals to be more efficient in their operations of production, WIP management, research and development, marketing, global recognition and sales. With the methodologies explained in its related chapters, this work aims to provide the individual with an economically stable, functioning establishment which enables the luthier to build, design, improve the instrument to his/her desire while sustaining a stable revenue source in order him/her to exist.

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APPENDICES

APPENDIX A: Vocational Glossary

Action: Action is the height of the strings on fingerboard. The changes of the milimetric heights of six course strings to fingerboard affects playability.

Assembly: The process of the making which include dimensioned wooden material to be joined together by the assistance of glue or bolts.

Blank: The blank is the form of the piece of wood takes when it has been prepared for dimensioning.

Body Shape: The desired shape of the sound box designed by the luthier. In electrical instruments, the body is generally made out of solid wood.

Brace: Pieces of wood glued inside of the soundboard. Desired dimensions and patterns affects the tonality of the guitar greatly.

Bridge: A bridge is the piece installed on the top side of the guitar that supports the strings and transmits the vibration of those strings to some other structural component of the instrument typically a soundboard, which transfers the sound to the surrounding air.

Density: The density, or the volumetric mass density, of a substance is its mass per unit volume.

Fret: Is the raised element extends across the full width of the neck, located on the fingerboard of the guitar. Contemporary frets made from copper and nickel alloy. Previous designs were made from ebony wood or tied strings.

Fret Buzzing: The problematic situation of one or more vibrating strings physically striking the frets that are higher than the fretted note (or open note). This causes a "buzzing" sound on the guitar that can range from a small annoyance, to severe enough to dampen the note and greatly reduce sustain.

Grain: The alignment of the cells relative to the long axis of the tree, straight, diagonal, interlocked and wavy grain.

Intonation: Intonation is the matching relation of the pitches in every sound and note an instrument has.

Jig: a device used to maintain mechanically the correct positional relationship between a piece of work and the tool or between parts of work during assembly.

Neck: The neck is the part of certain string instruments that projects from the main body and is the base of the fingerboard, where the fingers are placed to stop the strings at different pitches. Guitars, banjos, ukuleles, lutes, the violin family, and the mandolin family are examples of instruments which have necks

Neck Relief: Curvature caused by the tension of the strings pulling the headstock or peg head toward the body of the guitar. Severe relief in the neck can cause high action, uncomfortable playing, and may affect the intonation of the guitar. A small amount of relief is usually desired in guitar setups.

Power Tool: A power tool is a tool that is actuated by an additional power source and mechanism other than the solely manual labor used with hand tools.

Router: Is a tool used to hollow out an area in the face of hard, solid material. The router is most commonly used as a plunging tool and also inverted in a router table.

Sound Box: is an open chamber in the body of a musical instrument which modifies the sound of the instrument, and helps transfer that sound to the surrounding air.

Sound Board: The front part of the guitar body generally made of spruce wood family.

String: A string is the vibrating element that produces sound in string instruments such as the guitar, harp, piano (piano wire), and members of the violin family. Strings are lengths of a flexible material that a musical instrument holds under tension so that they can vibrate freely, but controllably.

Truss Rod: A solid metal bar reinforced with a plate, enables to adjust the neck relief in two directions (convex and concave).

Tap-Tone: The technique used by luthiers to designate a reference for the tone of the wood by gently tapping desired areas of the dimensioned wood.

APPENDIX B: Endorsement Term Agreement Sample

APPENDIX C: Individual Guitar Maker's Business Optimization Thesis Surveys

1- Individual Guitar Maker's Business Optimization Thesis Luthier Survey

2- Individual Guitar Maker's Business Optimization Thesis Guitarist Survey

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Education

Master: İstanbul Technical University, Center for Advanced Studies in Music (MIAM) –Music Business and Management Program

License: İstanbul Technical University – Turkish Music State Conservatory, Music Technologies Department – Instrument Making Program 2006-2014

High school: Ata College 2003-2006

Elementary: Lütfi Erçin Elementary School

Professional Career

Luthier - Murat Sezen Guitars (2005 -)

Brand Manager – Ned Pamphilon Istanbul 212 Collection (2010-2014)

Chief Manager of Operations – Active Events (2007-2014)

ITU-SEM London College of Music Examination Assistant (2014-)

Conferences & Events

Guitar Exhibition Participant and Conference Lecturer Bilkent University International Classical Guitar Meeting 2012

Guitar Exhibition Participant – Antalya International Guitar Meeting 2012

Guitar Exposition Exhibitor– Montreal Jazz Festival Guitar Exposition 2011

Guitar Making Workshop Lecturer, Exhibition Participant – II. ITÜ Guitar Meeting 2011

Guitar Making and Maintenance Semposium Lecturer, Exhibitor – Kocaeli University International Classical Guitar Meeting 2011

Guitar Exhibition Participant and Conference Lecturer Bilkent University International Classical Guitar Meeting 2010

Guitar Making Seminar Lecturer, Exhibitor– Kocaeli University Instrument Making Meeting 2010

ENDORSEMENT TERMS AGREEMENT

THIS ENDORSEMENT TERMS AGREEMENT ("Agreement") effective as of MONTH, DAY, YEAR by and between Steve Clayton, Inc. of 201 Rogue River Parkway, Talent, Oregon 97540 USA (also known as "steveclayton.com," and "claytoncustom.com" and hereafter referred to as "Clayton") and ENTER YOUR FULL NAME AND MAILING ADDRESS hereafter referred to as "Endorsee").

WHEREAS:

A. Clayton owns and operates a guitar manufacturing plant and an online custom imprinted guitar pick website, providing goods and services.

B. Endorsee is a musician which plays under the name YOUR NAME for the band BAND NAME

C. Clayton desires Endorsee to use and publicize Clayton's products in connection with Endorsee's work with BAND NAME and Endorsee desires to work with Clayton in connection with such an endorsement.

NOW, THEREFORE, in consideration of the forgoing recitals and the terms and conditions contained in this Agreement, Clayton and Endorsee agree as follows:

1. TERM.
   - 1.1 The Term of this Agreement shall begin on the date hereof and shall continue until the earlier of (I) twelve months or (ii) termination pursuant to Sections 1.3 and 1.4 hereof.
   - 1.2 This Agreement will automatically renew for an additional six (6) month period unless otherwise terminated by either party upon written notice given to the other party at least thirty (30) days prior to the expiration of the original Term.
   - 1.3 Either party may terminate this Agreement at any time without cause by giving the other party thirty (30) days' written notice of termination.
   - 1.4 In addition, either party may terminate this Agreement upon thirty (30) days' written notice to the other, in the event the other party breaches a material term of this Agreement and fails to cure such breach within the thirty (30) day period.

2. ENDORSEE'S OBLIGATIONS
   - 2.1 Throughout the Term of this Agreement, Endorsee shall prominently use, advertise and endorse Clayton products.
   - 2.2 Endorsee shall give Clayton his reasonable assistance in respect to the display and advertising of the Clayton brand name.
   - 2.3 Endorsee agrees to credit "Steve Clayton, Inc. Guitar Picks" in any C.D./cassette tape liner notes produced during the Term of this Agreement.
   - 2.4 Endorsee will arrange to add his endorsement of Clayton to the BAND NAME website and include a link to steveclayton.com.
   - 2.5 Endorsee agrees to promote Clayton in interviews, articles social media outlets and will notify Clayton of interviews and articles and expected dates of publication.
   - 2.6 Endorsee agrees to display the Clayton brand name on banners at

concerts/events. Clayton will provide this banner if necessary.

2.7 Endorsee agrees to give away Clayton guitar picks at events and concerts featuring BAND NAME. These picks will have the BAND NAME logo on one side and the Clayton logo on the other and will be provided to Endorsee pursuant to the terms of this Agreement.

2.8 If chosen to be a "featured artist" on the Clayton website, Endorsee will provide information and photos of himself and his group with a Clayton guitar pick prominently displayed.

3. CLAYTON'S OBLIGATIONS

3.1 Clayton shall give to Endorsee Clayton's reasonable assistance in displaying and advertising Endorsee and Endorsee's group, BAND NAME.

3.2 Clayton agrees to offer Endorsee a fifty-percent (50%) discount from retail prices on all Clayton basic stock items.

3.3 Clayton may periodically send Endorsee promotional material such as Tee-Shirts, stickers, etc. as well as free product samples of new items in the Clayton main product lines.

3.4 Clayton may periodically send Endorsee free product samples of new items that have come into their product line for comment and review by Endorsee.

3.5 Clayton will provide Endorsee seven hundred fifty (750) free custom guitar picks with the BAND NAME logo and Clayton logo if the artist is selected as a "Current Featured Artist" on the Clayton website. The guitar picks are to be used primarily as give-away items per Section 2.7 of this Agreement.

3.5 Clayton agrees to archive the information and pictures from "Current Featured Artist" under a "Prior Featured Artists" section of the website and will retain the information for the Term of this Agreement and any extension. While Endorsee is archived as a "Prior Featured Artist" on the Clayton website.

3.6 Clayton will offer Endorsee a twenty-five-percent (25%) discount from retail prices on all custom guitar pick orders. The Clayton name will be incorporated into all custom picks that the Endorsee receives a discount on.

4. PUBLICITY AND INFORMATION

4.1 Any and all information used by Endorsee concerning Clayton must be provided or approved in advance by Clayton and approval may be withheld at Clayton's sole discretion.

4.2 Any and all information used by Clayton concerning Endorsee or Endorsee's band, BAND NAME must be provided by and/or approved in advance by Endorsee and approval may be withheld at Endorsee's sole discretion.

4.3 Both parties specifically reserve the right to refuse any information which may be deemed of "questionable nature."

4.4 Both parties agree that any and all information received concerning the business and affairs of the other shall remain confidential and may only be disclosed to professional representatives and/or advisors or as may be required by law or by any legal or regulatory authority, provided, however, that in such an event, written notice of the information to be so disclosed shall be given as far in advance of its disclosure as is practicable and all best efforts will be made to obtain reliable assurances that confidential treatment will be accorded to such information required to be disclosed.

5. INTELLECTUAL PROPERTY

Clayton grants Endorsee a non-exclusive and worldwide license to display the Clayton brand merchandise, website features and related content during the Term solely for the purposes set out in this Agreement and in accordance with Section 4 of this Agreement. All intellectual property rights and any goodwill arising from and out of this Agreement shall remain the property of the benefited party.

6. INDEMNITY

Each party to this Agreement shall fully indemnify and hold harmless the other against any liability, damage, expense, loss, claim or cost with respect to any breach of the other's obligations or warranties set out in this Agreement.

7. GENERAL

7.1 This Agreement may not be assigned by either party without the prior written consent of the other. No permitted assignment shall relieve a party of its obligations hereunder prior to the assignment. Any assignment in violation of this Section 7.1 shall be void. This Agreement shall be binding upon the parties and their respective successors and assigns.

7.2 This Agreement constitutes the entire agreement of the parties and supersede all previous communications either written or oral between the parties with respect to the subject matter herein and no amendment or modification shall be valid or enforceable except by supplemental agreement in writing, executed by the parties hereto or the party to be bound.

7.3 The law of the State of Oregon shall govern the interpretation and enforcement of this Agreement.

7.4 The captions used in this Agreement are inserted only as a matter of convenience and for reference and in no way define, limit or describe the scope or the intent of this Agreement.

7.5 For the convenience of the parties, this Agreement may be executed in multiple counterparts, each of which shall constitute a complete original of this Agreement, which may be introduced in evidence or used for any other purpose without the production of any other counterparts.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and to become effective as of the day and year first above written.

Steve Clayton, Inc.

Signature _____

Print Name _____

Title _____

Date _____

YOUR NAME

Signature _____

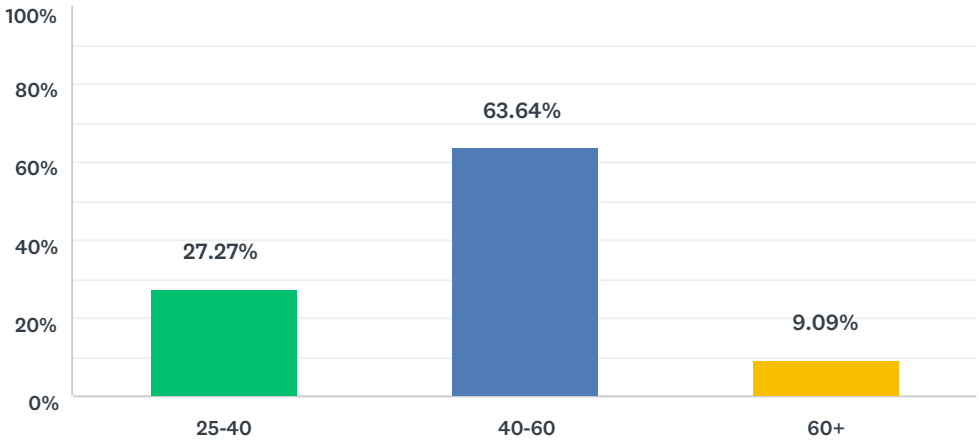
Print Name _____

Title_____

Date _____

Q1 Please specify your age.

Answered: 11 Skipped: 8

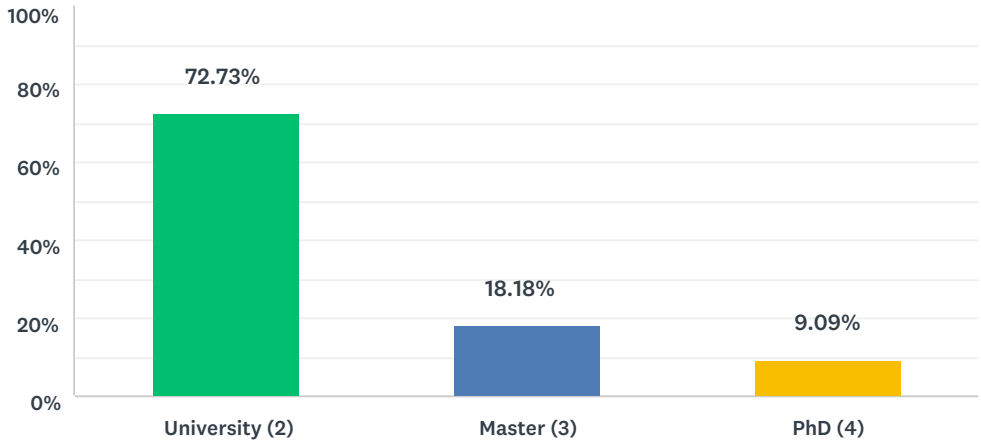


ANSWER CHOICES	RESPONSES	
25-40 (2)	27.27%	3
40-60 (3)	63.64%	7
60+ (4)	9.09%	1
TOTAL		11

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	4.00	3.00	2.82	0.57

Q2 Please specify your educational status.

Answered: 11 Skipped: 8

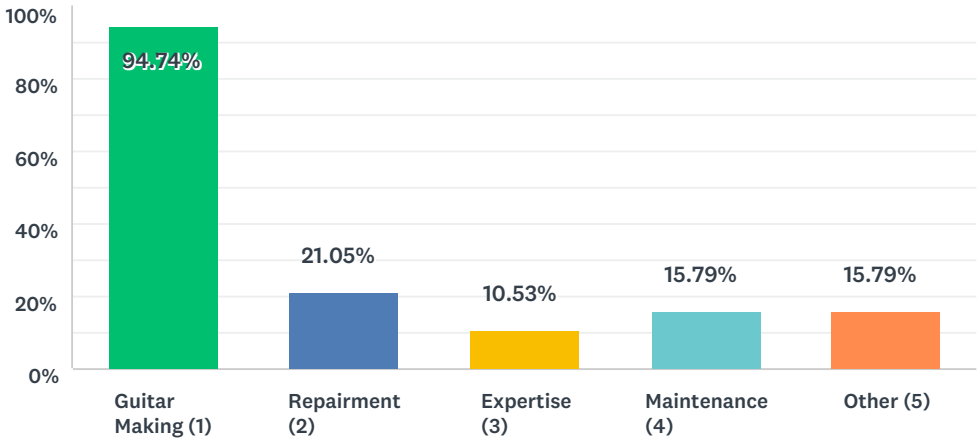


ANSWER CHOICES	RESPONSES	
University (2)	72.73%	8
Master (3)	18.18%	2
PhD (4)	9.09%	1
TOTAL		11

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	4.00	2.00	2.36	0.64

Q3 What is the main source of revenue for your workshop?

Answered: 19 Skipped: 0

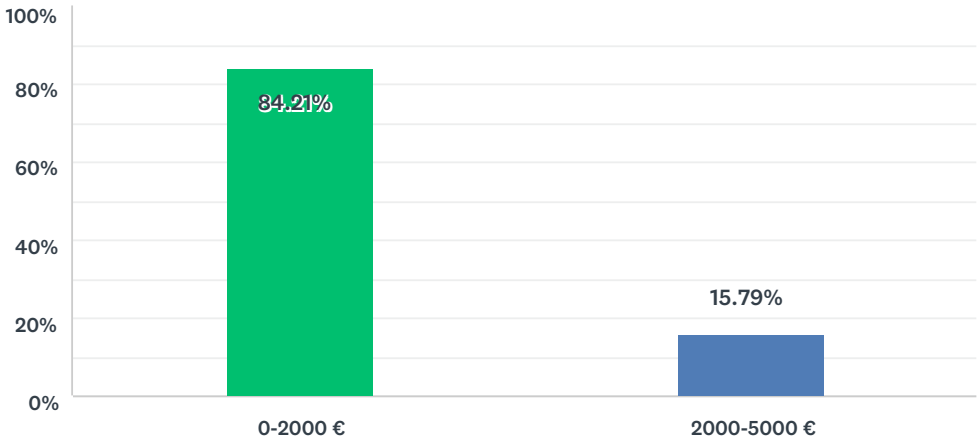


ANSWER CHOICES	RESPONSES	
Guitar Making (1)	94.74%	18
Repairment (2)	21.05%	4
Expertise (3)	10.53%	2
Maintenance (4)	15.79%	3
Other (5)	15.79%	3
Total Respondents: 19		

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	1.00	1.97	1.40

Q4 On monthly basis, how much is your average operational expenses?

Answered: 19 Skipped: 0

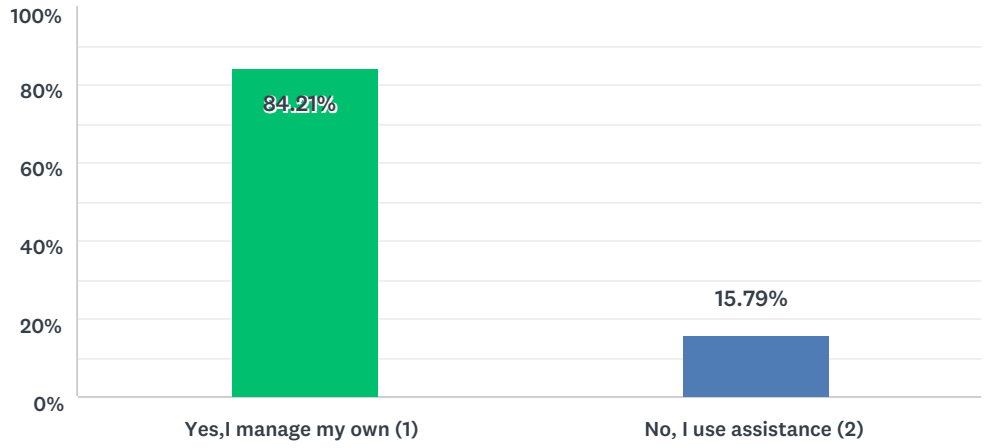


ANSWER CHOICES	RESPONSES	
0-2000 € (1)	84.21%	16
2000-5000 € (2)	15.79%	3
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.16	0.36

Q5 Do you manage your own finances or use any assistance from a professional?

Answered: 19 Skipped: 0

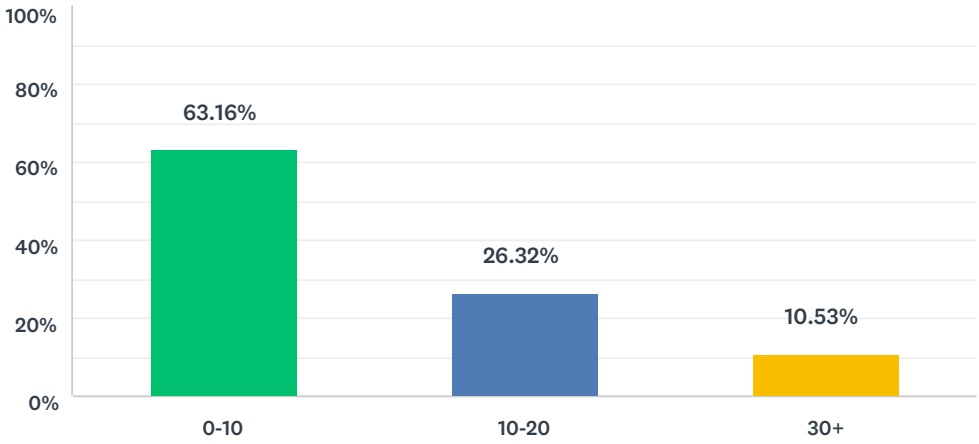


ANSWER CHOICES	RESPONSES	
Yes,I manage my own (1)	84.21%	16
No, I use assistance (2)	15.79%	3
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.16	0.36

Q6 On average basis, how many guitars you build annually?

Answered: 19 Skipped: 0

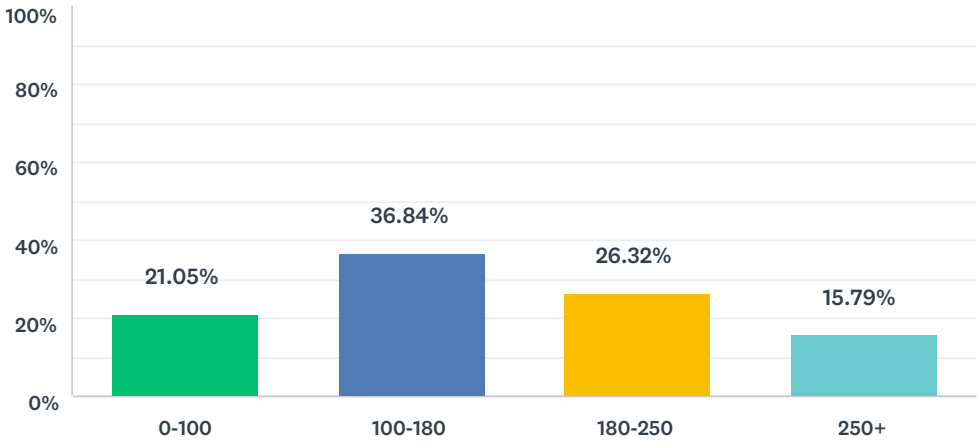


ANSWER CHOICES	RESPONSES	
0-10 (1)	63.16%	12
10-20 (2)	26.32%	5
30+ (4)	10.53%	2
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	1.00	1.58	0.94

Q7 How many hours you spend on each individual guitar?

Answered: 19 Skipped: 0

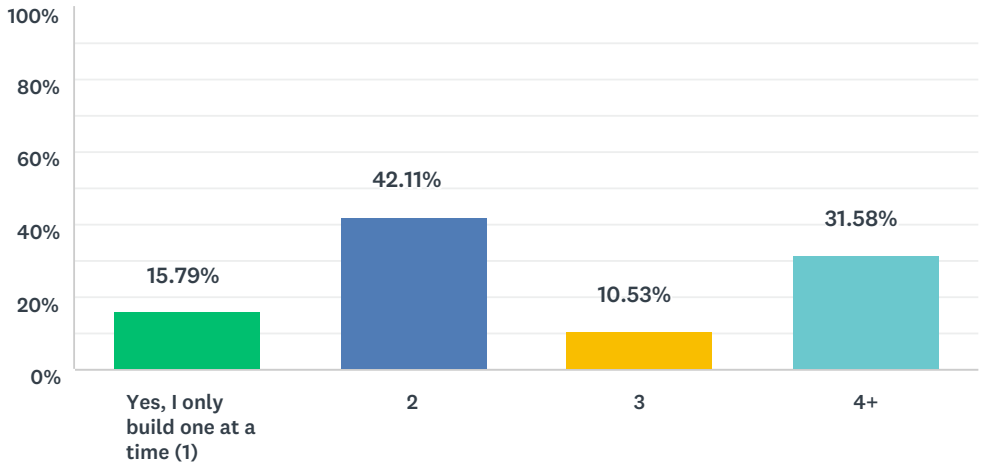


ANSWER CHOICES	RESPONSES	
0-100 (1)	21.05%	4
100-180 (2)	36.84%	7
180-250 (3)	26.32%	5
250+ (4)	15.79%	3
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	2.00	2.37	0.98

Q8 Do you only build one instrument at a time? If not, what is the amount of guitars you build simultaneously when starting to build an order?

Answered: 19 Skipped: 0

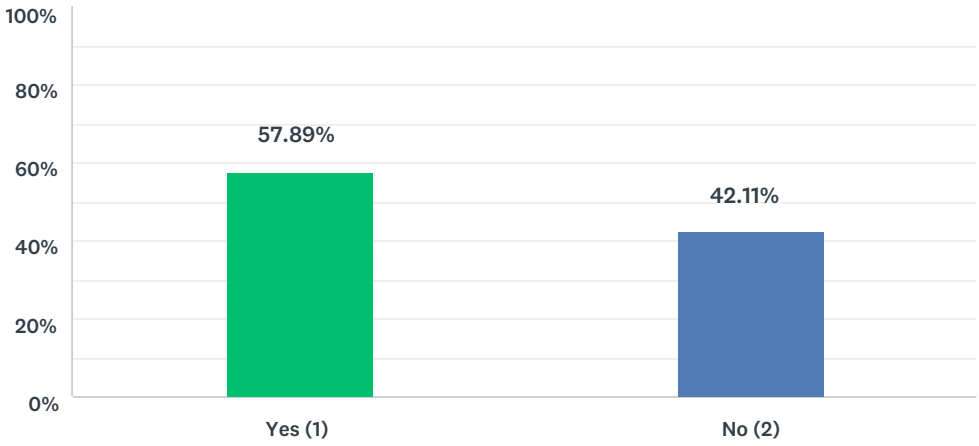


ANSWER CHOICES	RESPONSES	
Yes, I only build one at a time (1)	15.79%	3
2 (2)	42.11%	8
3 (3)	10.53%	2
4+ (4)	31.58%	6
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	2.00	2.58	1.09

Q9 Do you change the design of your guitar each time you start to build one?

Answered: 19 Skipped: 0

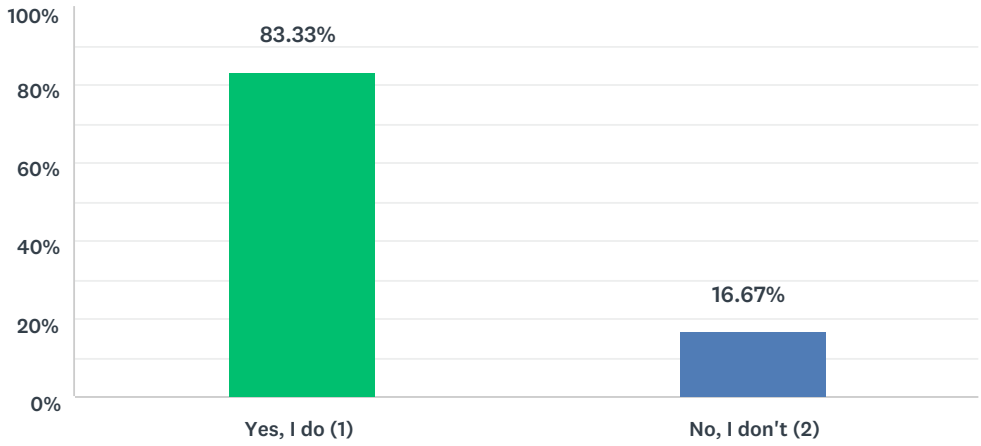


ANSWER CHOICES	RESPONSES	
Yes (1)	57.89%	11
No (2)	42.11%	8
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.42	0.49

Q10 If not, do you use templates in order to maintain sustainable dimensions in certain elements?

Answered: 18 Skipped: 1

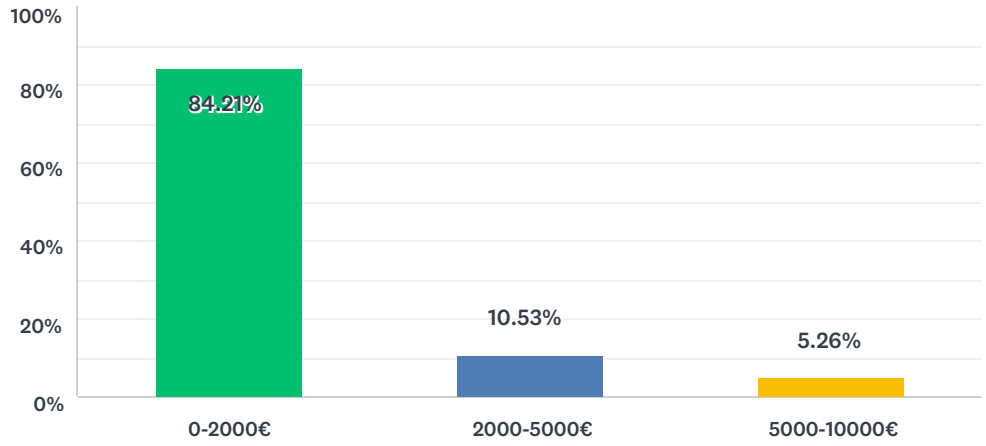


ANSWER CHOICES	RESPONSES	
Yes, I do (1)	83.33%	15
No, I don't (2)	16.67%	3
TOTAL		18

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.17	0.37

Q11 On average basis, what is the amount of money you spend annually to make additions to your wood stock?

Answered: 19 Skipped: 0

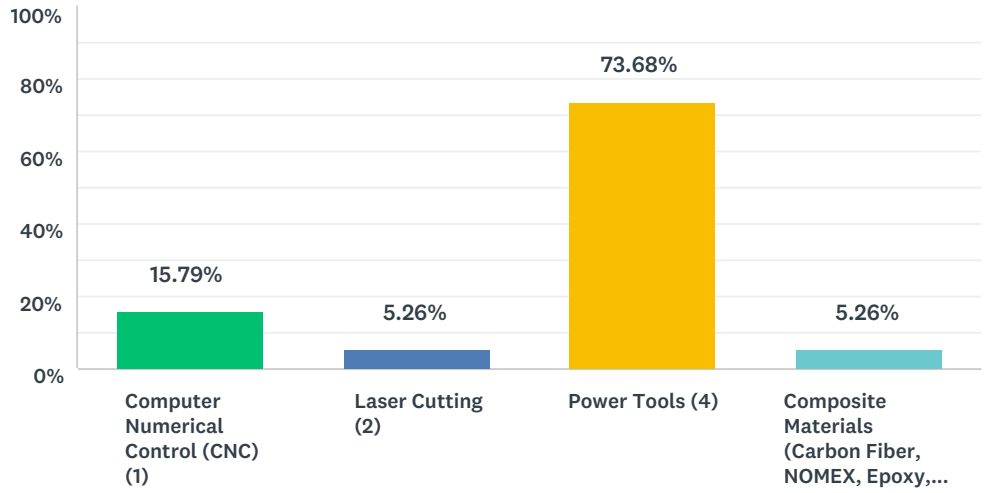


ANSWER CHOICES	RESPONSES	
0-2000€ (1)	84.21%	16
2000-5000€ (2)	10.53%	2
5000-10000€ (3)	5.26%	1
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	1.00	1.21	0.52

Q12 Please mark the technologies you use during the building process:

Answered: 19 Skipped: 0

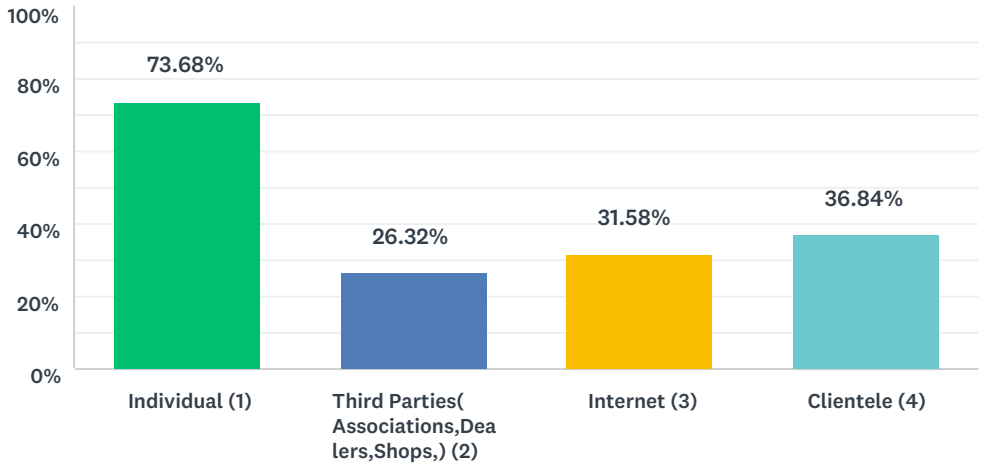


ANSWER CHOICES	RESPONSES	
Computer Numerical Control (CNC) (1)	15.79%	3
Laser Cutting (2)	5.26%	1
Power Tools (4)	73.68%	14
Composite Materials (Carbon Fiber, NOMEX, Epoxy, Various Alloys) (6)	5.26%	1
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	4.00	3.53	1.27

Q13 What is the main channel you use for taking orders? Please Mark :

Answered: 19 Skipped: 0

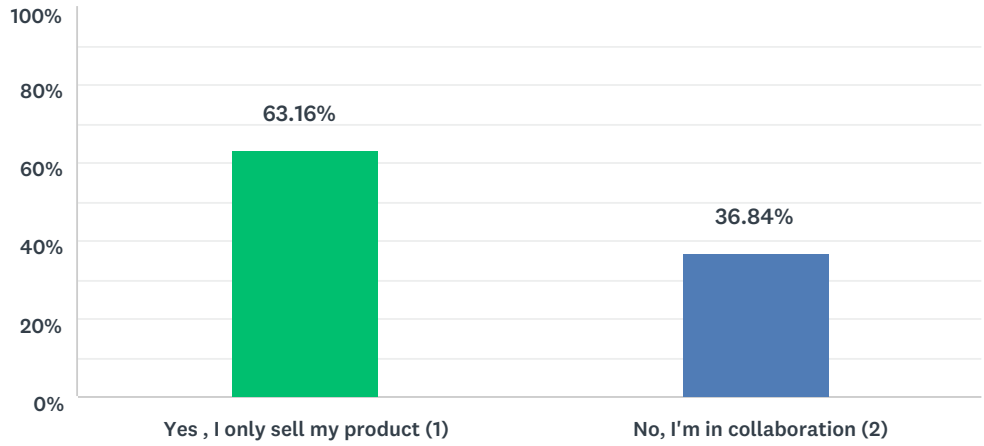


ANSWER CHOICES	RESPONSES	
Individual (1)	73.68%	14
Third Parties(Associations,Dealers,Shops,) (2)	26.32%	5
Internet (3)	31.58%	6
Clientele (4)	36.84%	7
Total Respondents: 19		

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	2.00	2.19	1.21

Q14 Do you only sell your product by yourself; if not are you in collaboration with any dealers or shops?

Answered: 19 Skipped: 0

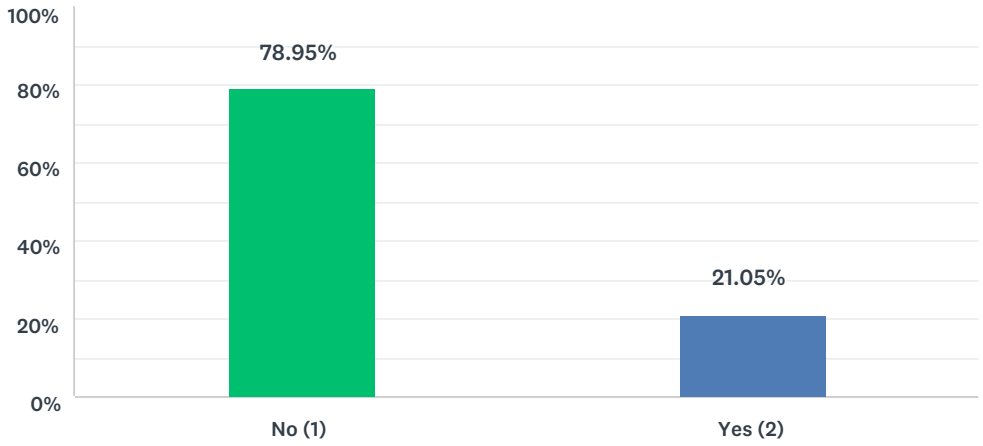


ANSWER CHOICES	RESPONSES	
Yes , I only sell my product (1)	63.16%	12
No, I'm in collaboration (2)	36.84%	7
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.37	0.48

Q15 Does your brand preserves any kind of endorsements? If yes, please specify.

Answered: 19 Skipped: 0



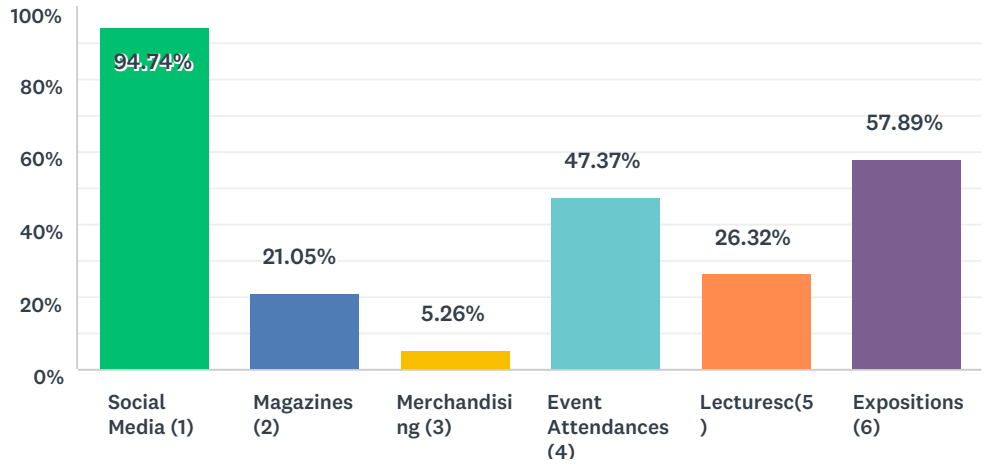
ANSWER CHOICES	RESPONSES	
No (1)	78.95%	15
Yes (2)	21.05%	4
TOTAL		19

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.21	0.41

#	YES(EVET)	DATE
1	Amerika'dan 3, İngiltere, Japonya ve Türkiye'den birer sanatçı ile endorsement anlaşması yapmış bulunmaktayız.	7/16/2017 8:24 PM
2	Professional Players	7/16/2017 9:10 AM
3	Not sure what you mean. People endorse my guitars	7/1/2017 7:20 PM
4	Can sengun	6/29/2017 7:09 PM

Q16 Do you use any kind of platforms to advertise your products? If yes please mark:

Answered: 19 Skipped: 0

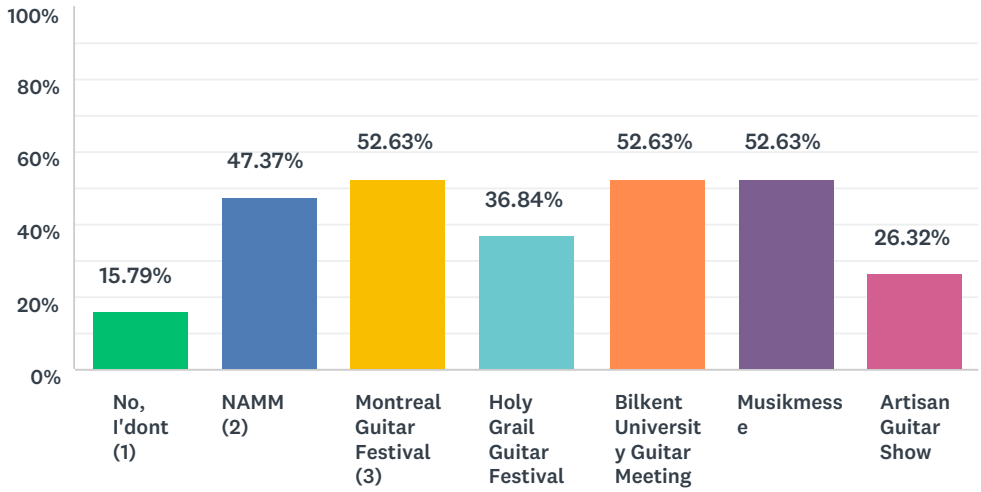


ANSWER CHOICES	RESPONSES	
Social Media (1)	94.74%	18
Magazines (2)	21.05%	4
Merchandising (3)	5.26%	1
Event Attendances (4)	47.37%	9
Lecturesc(5)	26.32%	5
Expositions (6)	57.89%	11
Total Respondents: 19		

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	4.00	3.25	2.05

Q17 Do you have any information about local and global expositions? If yes please mark the ones you're aware of or attended.

Answered: 19 Skipped: 0

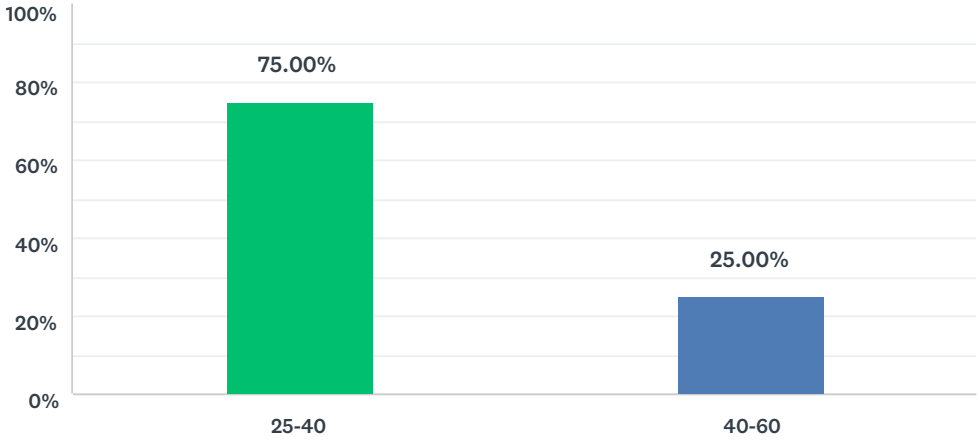


ANSWER CHOICES	RESPONSES	
No, I'dont (1)	15.79%	3
NAMM (2)	47.37%	9
Montreal Guitar Festival (3)	52.63%	10
Holy Grail Guitar Festival (4)	36.84%	7
Bilkent University Guitar Meeting (5)	52.63%	10
Musikmesse (6)	52.63%	10
Artisan Guitar Show (7)	26.32%	5
Total Respondents: 19		

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	7.00	4.00	4.15	1.76

Q1 Please specify your age.

Answered: 4 Skipped: 20

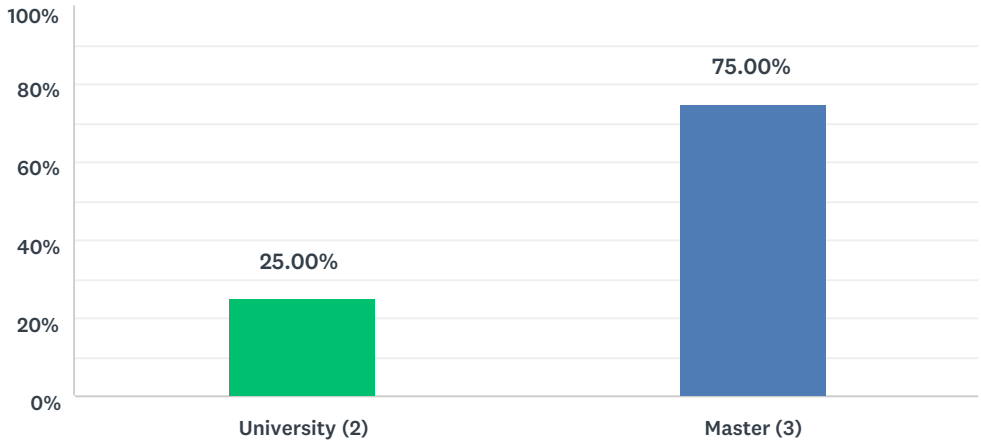


ANSWER CHOICES	RESPONSES	
25-40 (2)	75.00%	3
40-60 (3)	25.00%	1
TOTAL		4

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	3.00	2.00	2.25	0.43

Q2 Please specify your educational status.

Answered: 4 Skipped: 20

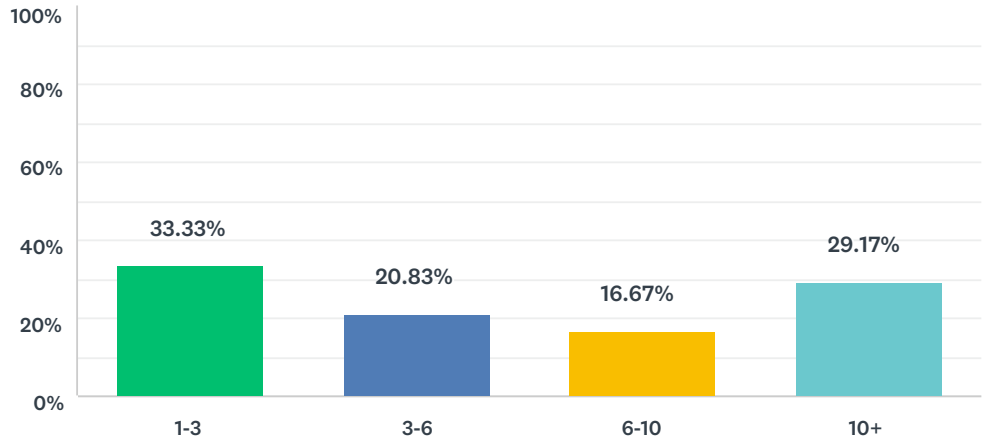


ANSWER CHOICES	RESPONSES	
University (2)	25.00%	1
Master (3)	75.00%	3
TOTAL		4

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	3.00	3.00	2.75	0.43

Q3 Approximately how many guitars do you posses?

Answered: 24 Skipped: 0

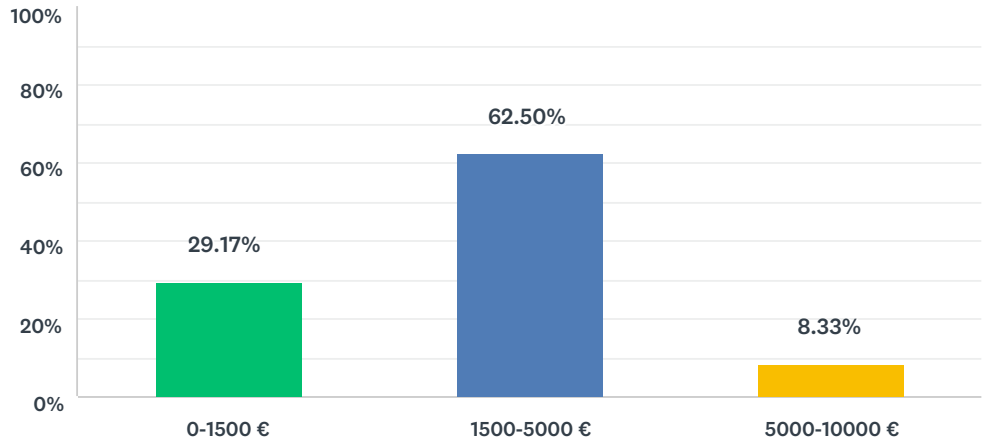


ANSWER CHOICES	RESPONSES	
1-3 (1)	33.33%	8
3-6 (2)	20.83%	5
6-10 (3)	16.67%	4
10+ (4)	29.17%	7
TOTAL		24

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	2.00	2.42	1.22

Q4 On average basis, how much money you spend on guitar purchasing in every 5 years?

Answered: 24 Skipped: 0

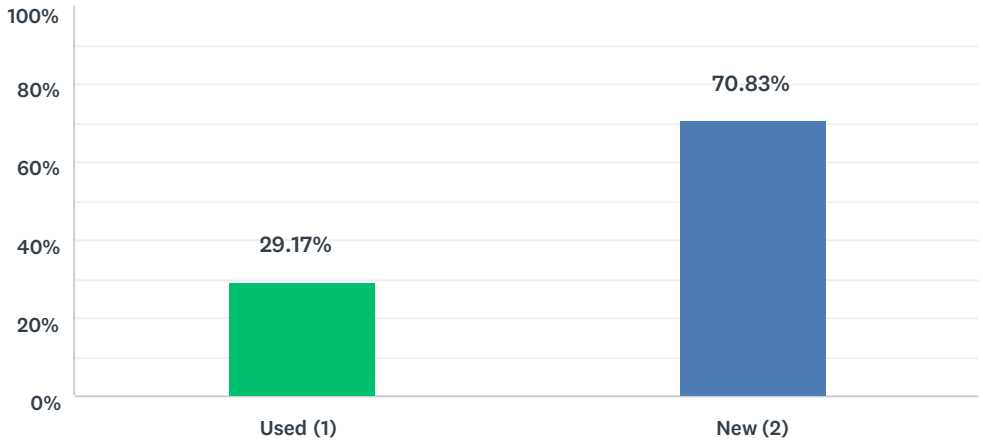


ANSWER CHOICES	RESPONSES	
0-1500 € (1)	29.17%	7
1500-5000 € (2)	62.50%	15
5000-10000 € (3)	8.33%	2
TOTAL		24

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	2.00	1.79	0.58

Q5 Do you prefer to buy used guitars, or brand new finished?

Answered: 24 Skipped: 0

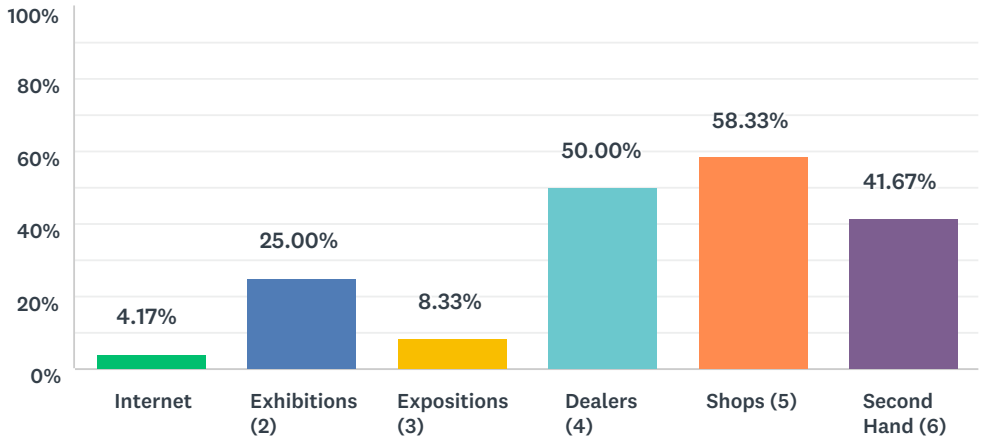


ANSWER CHOICES	RESPONSES	
Used (1)	29.17%	7
New (2)	70.83%	17
TOTAL		24

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.71	0.45

Q6 How do you mainly purchase guitars? Multiple choice

Answered: 24 Skipped: 0

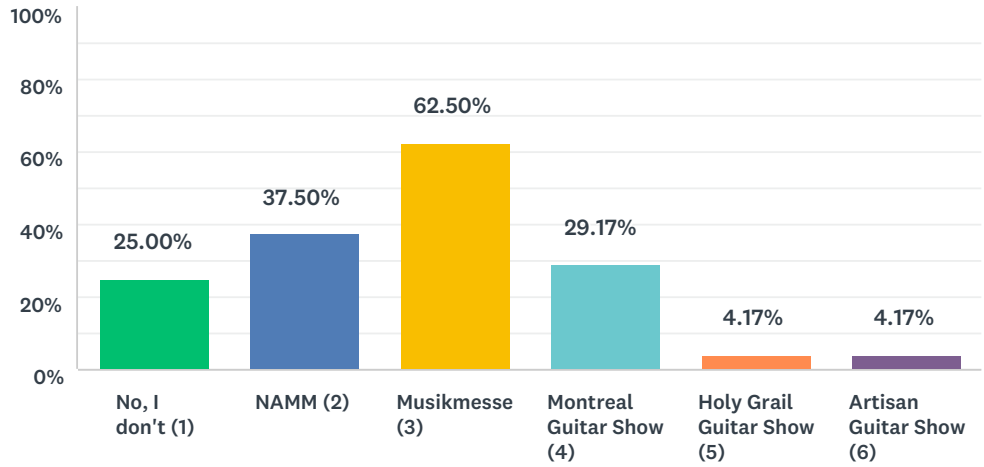


ANSWER CHOICES	RESPONSES	
Internet (1)	4.17%	1
Exhibitions (2)	25.00%	6
Expositions (3)	8.33%	2
Dealers (4)	50.00%	12
Shops (5)	58.33%	14
Second Hand (6)	41.67%	10
Total Respondents: 24		

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	5.00	4.38	1.35

Q7 Do you have information about Global Guitar Events, if yes please mark the ones you're aware of

Answered: 24 Skipped: 0

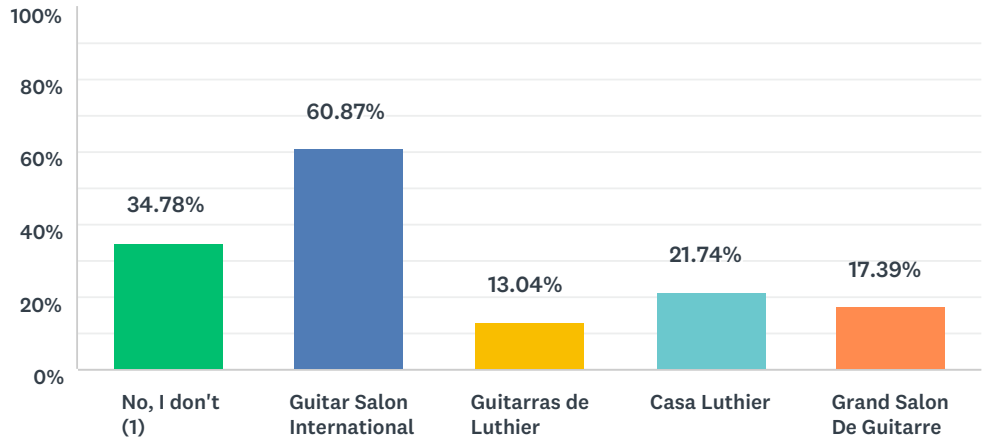


ANSWER CHOICES	RESPONSES	
No, I don't (1)	25.00%	6
NAMM (2)	37.50%	9
Musikmesse (3)	62.50%	15
Montreal Guitar Show (4)	29.17%	7
Holy Grail Guitar Show (5)	4.17%	1
Artisan Guitar Show (6)	4.17%	1
Total Respondents: 24		

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	6.00	3.00	2.77	1.14

Q8 Do you have information about Global High-End Guitar Dealers? If yes, please mark the ones you're aware of.

Answered: 23 Skipped: 1

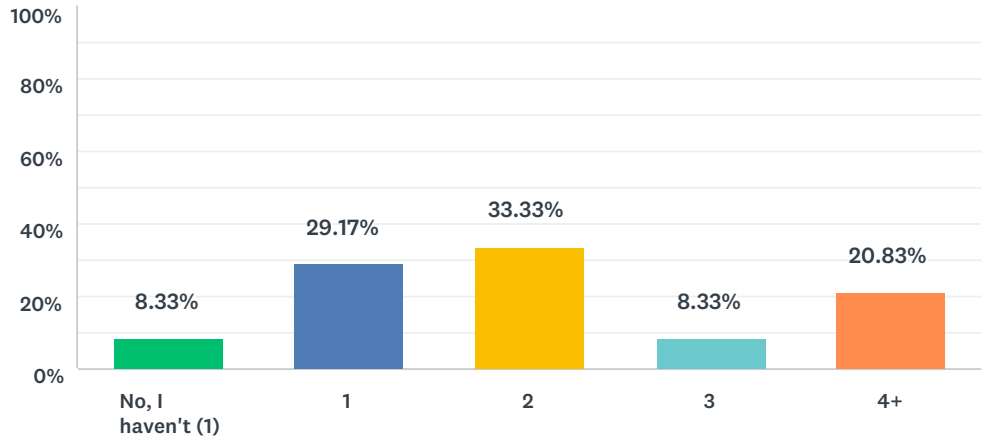


ANSWER CHOICES	RESPONSES	
No, I don't (1)	34.78%	8
Guitar Salon International (2)	60.87%	14
Guitarras de Luthier (3)	13.04%	3
Casa Luthier (4)	21.74%	5
Grand Salon De Guitarre (5)	17.39%	4
Total Respondents: 23		

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.50	1.31

Q9 Have you ever used a guitar made buy a Luthier? If yes how many?

Answered: 24 Skipped: 0

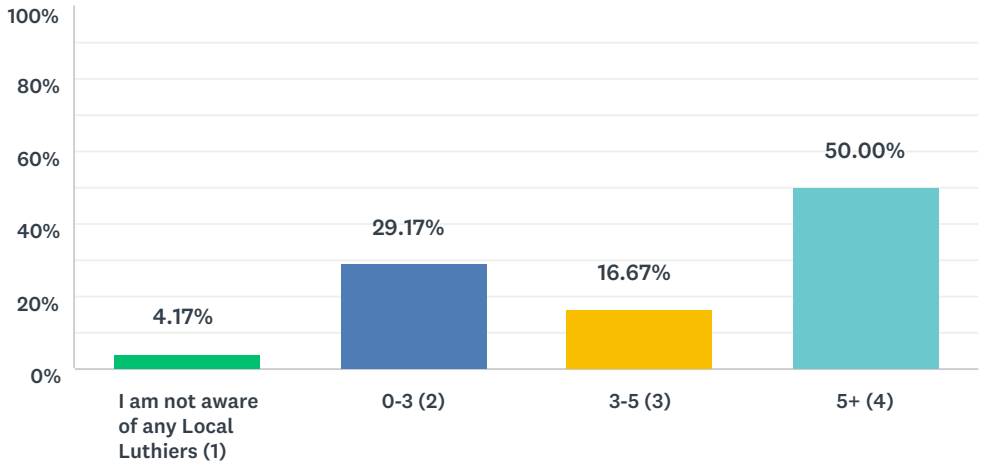


ANSWER CHOICES	RESPONSES	
No, I haven't (1)	8.33%	2
1 (2)	29.17%	7
2 (3)	33.33%	8
3 (4)	8.33%	2
4+ (5)	20.83%	5
TOTAL		24

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.04	1.24

Q10 How many Luthiers you're aware of locally?

Answered: 24 Skipped: 0

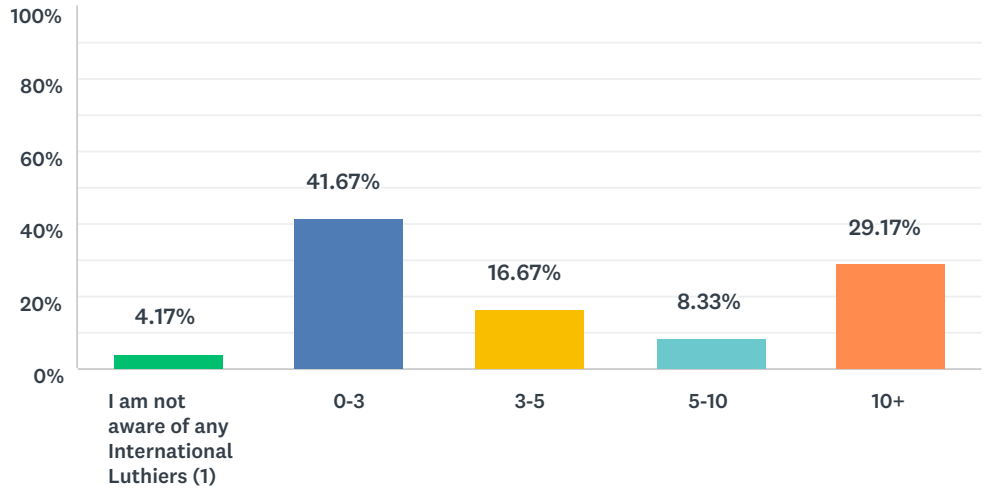


ANSWER CHOICES	RESPONSES	
I am not aware of any Local Luthiers (1)	4.17%	1
0-3 (2)	29.17%	7
3-5 (3)	16.67%	4
5+ (4)	50.00%	12
TOTAL		24

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	3.50	3.13	0.97

Q11 How many luthiers you're aware of internationally?

Answered: 24 Skipped: 0

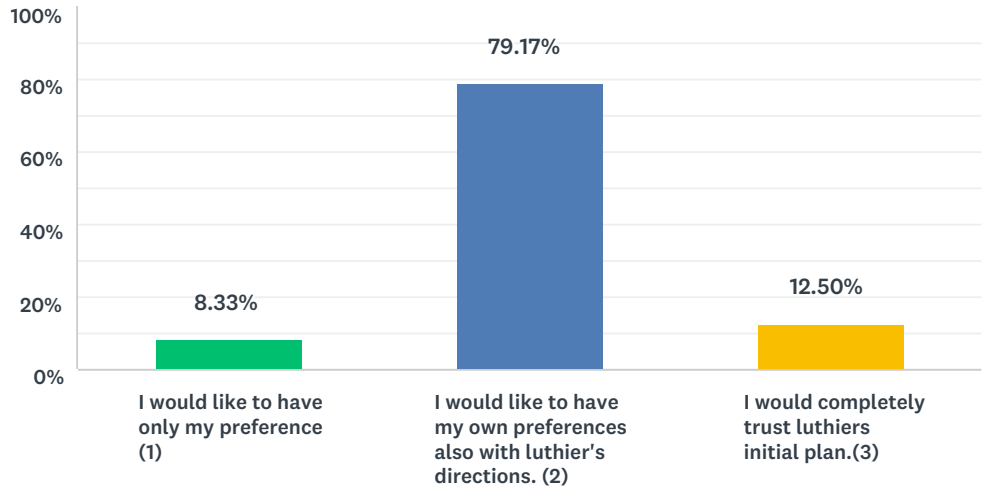


ANSWER CHOICES	RESPONSES	
I am not aware of any International Luthiers (1)	4.17%	1
0-3 (2)	41.67%	10
3-5 (3)	16.67%	4
5-10 (4)	8.33%	2
10+ (5)	29.17%	7
TOTAL		24

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.17	1.34

Q12 Do you prefer to choose your own instruments specs(wood choice,design,scale and such) or you count on the luthier’s initial plan?

Answered: 24 Skipped: 0

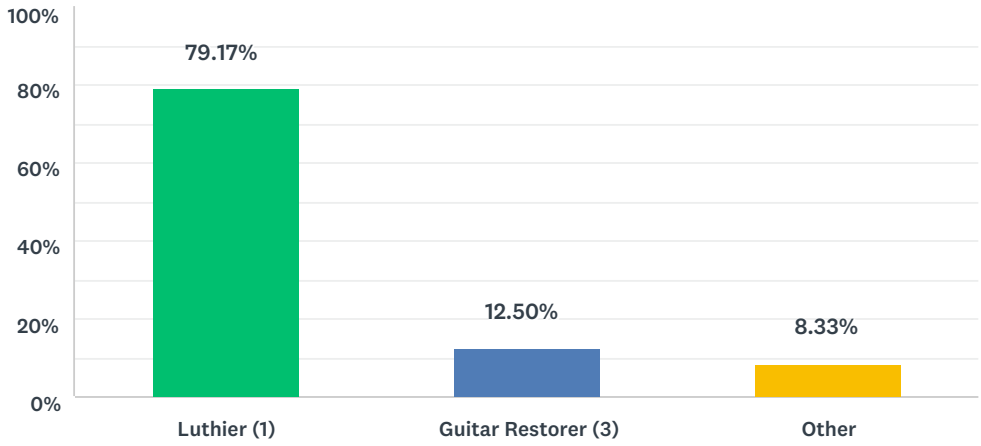


ANSWER CHOICES	RESPONSES	
I would like to have only my preference (1)	8.33%	2
I would like to have my own preferences also with luthier's directions. (2)	79.17%	19
I would completely trust luthiers initial plan.(3)	12.50%	3
TOTAL		24

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	2.00	2.04	0.45

Q13 Do you prefer luthier's to do the fundamental maintenance for your guitars or other individuals who specializes guitar maintenance ?

Answered: 24 Skipped: 0



ANSWER CHOICES	RESPONSES	
Luthier (1)	79.17%	19
Guitar Restorer (3)	12.50%	3
Other (4)	8.33%	2
TOTAL		24

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	1.00	1.50	1.00