NOVA SCHOOL OF BUSINESS & ECONOMICS

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"FOSTERING THE JEWELLERY AND WATCH INDUSTRY THROUGH THE LENS OF THE PORTUGUESE ASSAY OFFICE WITH A SHARED VALUE APPROACH"

MAFALDA SALGUEIRO FILIPE (44550)

"Exploring the Trends of the Jewellery and Watch Industry in the Portuguese Market and Analysing the Sector's Value Chain"

Master Thesis supervised by

Professor Constança Monteiro Casquinho

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Abstract

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Contrastaria, an independent business unit belonging to Imprensa Nacional Casa da Moeda, is responsible for certifying and monitoring precious metal items within the Portuguese Jewellery and Watch Industry. In Portugal, with some exceptions, all precious metals artefacts are required to be hallmarked before being introduced in the market, guaranteeing the product's authenticity and securing the market's credibility. The Consulting Project addresses the challenge of "Fostering the Jewellery and Watch Sector through the Lens of the Portuguese Assay Office with a Shared Value Approach". The Thesis was carried out using a problem-solving driven approach, where the Team sought to validate several beforehand-created hypotheses. The validation process consisted of an in-depth internal and external analysis, based on primary – interviews and surveys – and secondary data – papers, reports, and frameworks. Accordingly, meaningful insights were gathered, guiding the formulation of impactful recommendations that will increase the awareness of the Portuguese population regarding Contrastaria's Mission and Hallmarks, generate internal processes' efficiency, and protect online consumers of precious metal artefacts. Consequently, in a more holistic view, the Portuguese Assay Office's recognition will be enhanced, customer satisfaction improved, online demand and supply for precious metals jewellery strengthened, and the online Imitation Jewellery Market weakened. Therefore, successfully solving the challenge proposed by Contrastaria, adding value to the institution and placing it in the industry's core.

The individual work developed focuses on the Jewellery and Watch Industry analysis, by the comprehension of the (1) Precious Metals Value Chain and the (2) STEEP framework. The (1) Precious Metals Value Chain represents every stage a precious metal artefact goes through, allowing a deeper understanding of each industry player and their respective pain points and strengths. The (2) STEEP framework, on the other hand, evaluates all the external forces that impact Contrastaria's operations, highlighting potential market opportunities or even threats within the industry. Accordingly, the Jewellery and Watch Sector has been strongly affected by the pandemic crisis. However, almost every player is recovering and re- establishing pre-pandemic levels. The industry's current trends rely on the adoption of sustainable processes and techniques, the Imitation Jewellery Market's growth, and the continuous increase of online demand. All things considered, the Team's recommendations will tackle or exploit such tendencies.

Keywords: Assay Office, Assaying, Business Value Creation, Communication Strategy, Consulting, Contrastaria, Creating Shared Value, Digitalisation Strategy, Economic Operators, End-Customers, Hallmarking, Jewellery, Precious Metals, Social Value Creation, Strategy

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Agenda

The project is focused on comprehending the Portuguese Jewellery and Watch Industry and consumers' perceptions regarding Contrastaria with the aim of dynamizing the Sector, through increases in process efficiency and awareness

A. Executive Summary

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Executive Summary

Situation: Contrastaria is an established Portuguese institution, which belongs to Imprensa Nacional Casa da Moeda, operating for more than 130 years with the primary objective of assaying and hallmarking all the precious metal items introduced in the Portuguese market

Complication: By being the only precious metal certifying institution in Portugal, Contrastaria's operations are obliged to be extremely efficient, as the market is highly reliant on in-time delivery. Furthermore, as a consumer rights' advocate, awareness needs to be raised amongst the Portuguese population, to protect buyers and prevent potential forgeries

Question: Could the Jewellery and Watch Sector be dynamized through a shared value approach introduced by the Portuguese Assay Office?

Answer: Yes, through the introduction and implementation of clear and strong shared value initiatives. Consequently, the Portuguese Jewellery and Watch Industry will be vitalised, and the consciousness of end-consumers raised

Project Goals: **(1)** Comprehend the industry value chain, the customer, and the Portuguese population's perception; **(2)** Examine Contrastaria's internal processes and systems; **(3)** Develop a communication and digitalization strategy that are aligned with the Portuguese Assay Office's overall strategy

Recommendations: For the main purpose of dynamizing the Jewellery and Watch Industry, the Team proposes the development of a communication and digitalization strategy that will be focusing on **(1)** creating awareness amongst national population regarding the Portuguese Assay Office mission and the importance of hallmarking through paid social media advertising, **(2)** digitalizing Contrastaria's internal processes to achieve a higher degree of efficiency and error reduction, **(3)** and create a digital certification for online shopping of precious metal items that will raise buyer's trust and foster loyal competition amongst Economic Operators

Implementation Plan & Impact: An implementation roadmap with the duration of at least 4 years was presented, explaining the timing and rationale of each implementation step, followed by the definition of success and expected impact

Source: Team based

To exhaustively analyse the Jewellery and Watch Industry and understand Contrastaria's competitive position, frameworks, models, papers and theories were considered and extensively reviewed

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B.1. Methodology I Literature Review (I/II)

Methodology – The Master Thesis consisted in the development of a Consulting Project, in collaboration with Contrastaria, a business unit belonging to Imprensa Nacional Casa da Moeda. The purpose of a Consulting Team, as defined by Minto, B. (2008) and Raisel E. in "The McKinsey Way" (1999), consists in pursuing a problem-solving driven methodology. The Team must start by developing solutions, the so-called initial hypothesis (IH), to the overriding question that are fact-based, rigidly structured and hypothesis driven. The essence of IH is to determine the solution to the problem before starting. To structure the IH, the Team should break the problem into its components through deductive reasoning ("Why is the solution possible?") and inductive reasoning ("How can the organization apply the solution?"). The combination of different reasonings will be enriched by five relevant frameworks and supportive papers, that will now be explained. Firstly, to fully understand the most important concept of this Project, Creating Shared Value, the paper **"Creating Shared Value – How to reinvent capitalism – and unleash a wave of innovation and growth"** (2011) written by Michael E. Porter and Mark R. Kramer, and published by Harvard Business Review was analysed. The report focuses on three forms for shared value creation, namely reconceiving products and markets, redefining productivity in the value chain and enabling local cluster development. The elaboration of worldwide Creating Shared Value best practices was also considered relevant for an in-depth analysis of the concept and identification of potential applications for Contrastaria. Furthermore, the main existing differences and similarities between Creating Shared Value and Corporate Social Responsibility were considered for the analysis. Secondly, in order to understand the whole organization and its crucial elements, **The Business Model Canvas**, developed and written by Alexander Osterwalder and Pigneur (2011), was reviewed. The framework offers an overview of how Contrastaria is placed within the industry and how it's establishing relationships with all segments. Additionally, with the aim of understanding the main drivers of change and evaluate different detailed external factors that impact an organization, mainly nominated as macroeconomic variables that are expected to affect a company's context in a specific industry, the **STEEP** Framework was developed and analysed. This model, written and proposed by Francis J. Aguilar (1967), is composed by 5 forces: Social-demographic; Technological; Economic; Environmental; and Political-Regulatory – which all impact the company's performance and strategic orientation, highlighting potential opportunities and threats. Moreover, by interconnecting 7 main elements that are correlated with each other and where a change in one element will put in cause the other six, the **McKinsey 7S Model –** featured in the book "In Search of Excellence" (1982) written by Thomas J. Peters and Robert H. Waterman – is one of the most prestigious and popular strategic planning tools. The model focuses especially on human resources, rather than the traditional mass production tangible of capital, equipment and infrastructure, critical for top firms' organizational structure. The model combines 7 elements: Structure; Strategy; Systems; Skills; Style; Staff and Shared Values. Additionally, to examine and understand Contrastaria's Strengths, Weaknesses, Opportunities and Threats, which might impact the industry and affect the future of the business, the **SWOT** analysis – conceived by Albert Humphrey (1960) – was conducted. This model cannot be totally complete without the analysis and development of the framework **TOWS**, which combined with the findings retrieved from the SWOT analysis, enables a deeper understanding of existing strategic options and foresight future developments.

Source: Team based

To exhaustively analyse the Jewellery and Watch Industry and understand Contrastaria's competitive position, frameworks, models, papers and theories were considered and extensively reviewed

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B.1. Methodology I Literature Review (II/II)

Additionally, the **Porter's Value Chain Model** – developed by Michael Porter (1985) – was applied with the goal of understanding Contrastaria's internal operations, namely its Support Activities: Firm Infrastructure; Human Resource Management; Technology Development; and Procurement - and Primary activities: Inbound Logistics; Operations; Outbound Logistics; Marketing & Sales; and After-Sales Service. Furthermore, it couldn't be possible to perform an extensive analysis of the Jewellery and Watch Industry without examining external information, such as the paper from Deloitte – **"Sector da Contrastaria em Portugal – Enquadramento e Apresentação"** (2012) – which presented crucial information and thought structuring regarding the Portuguese Jewellery and Watch Industry, having a better overview of what is happening currently and what might come in the future, such as possible opportunities or threats, changing the alignment of Contrastaria. The development and selection of potential hypothesis to validate, were based on the application of the **Eisenhower Priority Matrix** – written and developed by Dwight D. Eisenhower (1961). The model facilitated the analysis of which hypothesis should be considered to be analysed and validated further, based on three criteria – impact on the industry, impact in shared value and complexity of each initiative. Additionally, the research design, which had the purpose of better understanding Portuguese customers and their relationship with both Contrastaria and the Portuguese Jewellery and Watch Industry, was divided into primary data and secondary data. Considering the primary data, it was subdivided into two different forms of data collection: qualitative, integrating in-depth interviews that targeted Portuguese consumers and Economic Operators; and quantitative, with two different surveys. The first one evaluated the existing awareness and relationship with Contrastaria of Portuguese consumers while the second one focused on the opinion of consumers about different means of promotion. The in-depth interviews, as proposed by Naresh K. Malhotra and David F. Birks (2017), allow to identify insights; delineate key variables; develop hypotheses; and thoughts that otherwise would not be mentioned or described. Finally, the **Agile Methodology** was applied. It involves constant collaboration with stakeholders and continuous improvement at each stage. Once the project starts, teams should cycle through a process of planning, aligning expectations, executing and evaluating. Continuous syndication and co-creation is vital for a successful project development, both with team members and stakeholders, which in this context consists in the relationship built with Contrastaria's council of administration

Considering the presented topics of the literature review – namely, in terms of crucial aspects and concepts; research methods; and experimental techniques that are extremely valuable to use – the Team not only was able to further develop necessary theoretical expertise but to also apply the frameworks reviewed enabling the understanding and comprehension of the Jewellery and Watch Industry and Contrastaria's business model. Thus, it is possible to confidently state that this literature review tremendously helped the Team successfully achieve the project's end-goal – Fostering the Jewellery and Watch Sector through the lens of the Portuguese Assay Office with a Shared Value approach –, and therefore, maximizing the value added to the project

Source: Team based

The project is divided into three main subtopics, each one with specific goals and deliverables, enabling a perfect alignment of the project scope with the client, crucial to guarantee successful outcomes

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B.2.1. Methodology I Project Methodology I Collaboration Goals and Scope

	Internal and external analysis	Identification of opportunities to dynamize the sector through shared value initiatives	Contribution to a successful introduction of shared value initiatives
Goals	• Understanding the market and its current and future trends • Examine Contrastaria's business model, and its currents strengths and weaknesses • Identification of possible risks and opportunities • Identifying the various Economic Operators and analysing their impact on Contrastaria's business	• In-depth overview of the Creating Shared Value concept and presentation of best practices in the field • International Assay Offices' Best Practices analysis • Identification of relevant opportunities for the Portuguese Assay Office to create shared value	• Identification of opportunities for Contrastaria in Creating Shared Value and elaboration of a strategy for their successful introduction • Analysis of KPIs that will measure the impact of the proposed solutions • Raising awareness of the population about Contrastaria's business model and main mission
Deliverables	• Research regarding the current situation of the Portuguese Jewellery and Watch Sector • Analysis of the Precious Metals Industry Value Chain • Research about INCM and Contrastaria	• Research on Creating Shared Value • Benchmark and Best practices analysis (BPs) • Presentation of the quantitative and qualitive conclusions gathered through the surveys and interviews conducted	• Recommendations • Financial Analysis • Implementation roadmap • Definition of success and KPIs
Out of Scope	• Research focused on Economic Operators external to the sector • Analysis of the Jewellery and Watch Sector at an international level	• Benchmark and best practices analyses outside the hallmarking business or external to the Creating Shared Value concept • Analysis of consumption patterns in other sectors or countries	• Implementation of the proposed recommendations • Pricing Strategy and detailed financial projections • Allocation of human resources • Advertising campaign content or calendar planning

Source: Team based

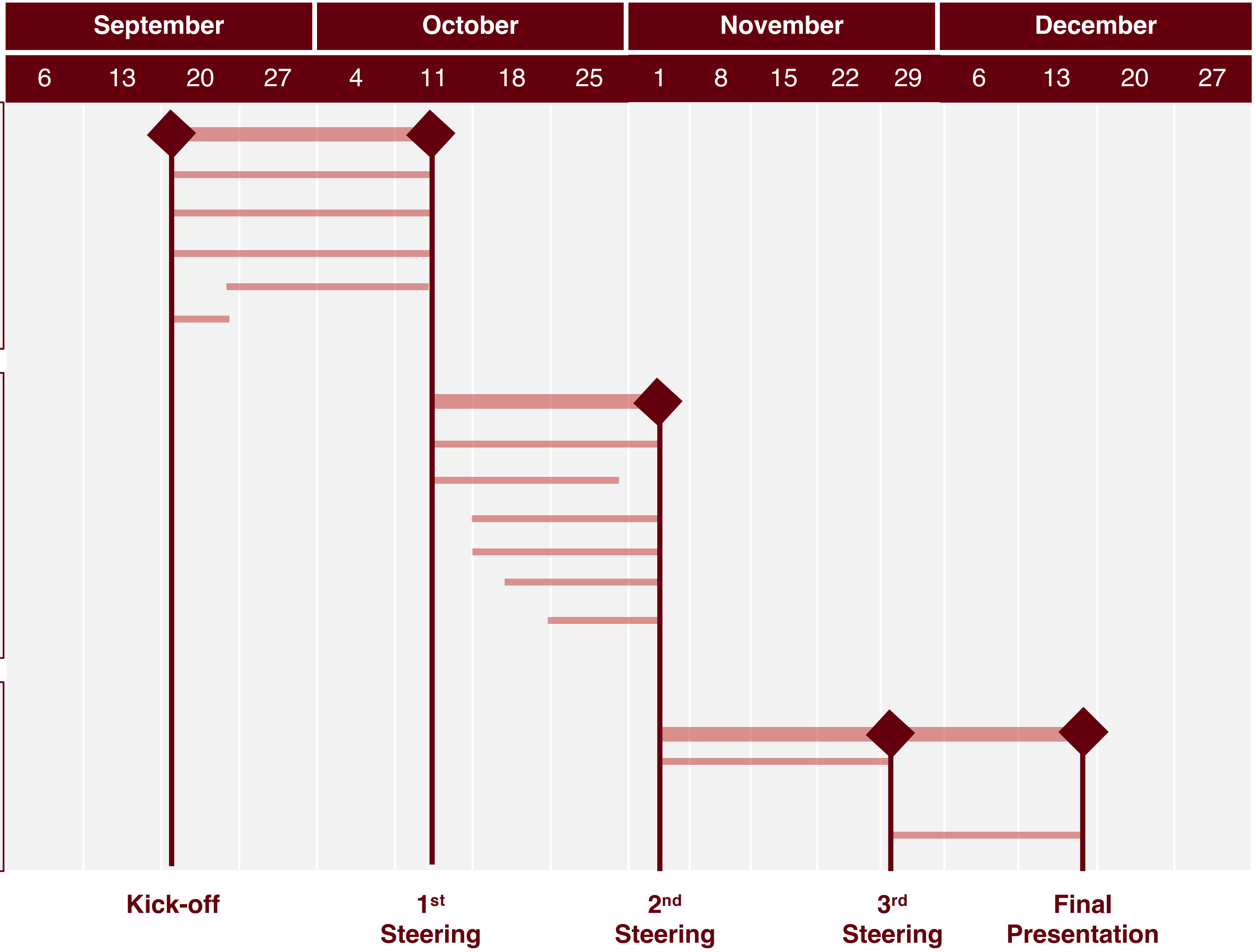
The project was developed following the Agile methodology, promoting syndication and co-creation with the client Contrastaria. Therefore, it was crucial to have five distinct moments of formal interaction throughout the project

B.2.2. Methodology I Project Methodology I Project Calendar

Diagnosis
- Theoretical review of Contrastaria's business
- General overview of the market
- Revision of the concept of Creating Shared Value
- Preliminary organisational analysis of INCM
- Alignment of expectations with INCM

Analysis
- Understand current tendencies of the market
- Benchmarking and Best Practices analysis
- Evaluation of the needs of Economic Operators
- Potential impact of a Creating Shared Value solution
- Analysis and evaluation of strategic partnerships
- Resources and capabilities (R&Cs) analysis

Recommendations
- Proposal of an approach to Creating Shared Value for Contrastaria
- Creation of an action plan, laying out the proposed strategy for the implementation of the recommendations



Source: Team based

The approach for the project entails three initial steps to enable the development of concrete, implementable recommendations which, in turn, will allow Contrastaria to successfully dynamize the sector

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B.2.3. Methodology I Project Methodology I Project Approach

DIAGNOSIS → **ANALYSIS** → **STRATEGY FORMULATION** → **RECOMMENDATIONS**

Kick-Off

Initial Diagnosis
- Theoretical review of the Portuguese hallmarking business
- Review of the Creating Shared Value concept
- Overview of the main market trends and stakeholders
- General outlook of the organization: mission, vision, values, business portfolio and current strategy

Project Details and Goals Alignment
- Alignment of expectations with INCM
- Definition of the project scope, goals and deliverables
- Establishment of the project calendar

Issue Analysis

External Analysis
- Analysis of opportunities and threats in the hallmarking business
- Best practices analyses of International Assay Offices
- Benchmarking and best practices analyses of Creating Shared Value Initiatives
- Analysis of the needs and wants of the Economic Operators

Internal Analysis
- Analysis of current services portfolio
- Key resources and capabilities of Contrastaria
- Current customers pain and pleasure points

Fact Pack

Issue Framing
- Definition of several hypotheses and respective analysis
- Development of a Priority Matrix to assess which hypothesis to validate

Plan Formulation
- Definition of a value proposition
- Definition of clear strategies relying on a Creating Shared Value approach

Value Proposition

Action Plan
- Development of an action plan that dynamizes the Jewellery and Watch Sector, benefiting all stakeholders, following a shared value approach

Implementation Plan
- Development of a clear roadmap for a successful implementation of the recommendations

Impact Assessment
- Definition of the main KPIs
- Forecast of costs

Source: Team based

The SCQA framework, widely used in Consulting, offers a general overview of the problem, which then evolves into the creation of an issue tree, a structured and MECE breakdown of the existing complication

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B.2.4. Methodology I Project Methodology I SCQA and Issue Tree Overview

SITUATION	Contrastaria is an established Portuguese institution, which belongs to Imprensa Nacional Casa da Moeda, operating for more than 130 years with the primary objective of hallmarking and testing all the precious metal items introduced in the Portuguese market
COMPLICATION	By being the only precious metal certifying institution in Portugal, Contrastaria's operations are obliged to be extremely efficient, as the market is highly reliant on in-time delivery. Furthermore, as a consumer rights advocate, awareness needs to be raised amongst the Portuguese population, to protect buyers and prevent potential forgeries
QUESTION	Could the Jewellery and Watch Sector be dynamized through a shared value approach introduced by the Portuguese Assay Office?
ANSWER	**YES**

WHY? There is an external opportunity and internal capabilities

External		Internal	
Opportunities	Threats	Strengths	Weaknesses
Non-Official Services	Service of Tags	Know-how	Public Institution
Consulting Support	Dependence on Big Clients	Exclusivity	Client's Gap
Digital Innovation	Dependence on the Sector	Credibility	Shared Value Initiatives

HOW? Through the introduction and implementation of clear and strong shared value initiatives

Communication Strategies and Awareness Approaches		Digitalization of Processes and Systems	
Physical	Digital	Processes	Systems
Flyers	Economic Operators' Websites	Internal Processes	Digital Certification
Business Cards	Social Networks	Chatbot	Feedback Collection
Price Tags	TV and News Broadcast		

Source: Team based

To validate the overriding question, the deductive reasoning is applied through the execution of an external and internal analyses, followed by the inductive reasoning on the formulation of how to address the challenge

B.2.5. Methodology I Project Methodology I Methodology Rationale

COULD THE JEWELLERY AND WATCH SECTOR BE DYNAMIZED THROUGH A SHARED VALUE APPROACH BY THE PORTUGUESE ASSAY OFFICE?

Yes

Why?

Deductive Reasoning

There are external opportunities and the respective internal capabilities to pursue them

Internal | External

Therefore, Contrastaria could dynamize the Jewellery and Watch Sector

How?

Inductive Reasoning

Through the introduction and implementation of clear and strong shared value initiatives

Digitalization | Communication Strategy

Hypotheses formulation and testing

Source: Team based

The analysis of the main external and internal forces to the company facilitates the evaluation of existing resources and industry tendencies, verifying the factors that will contribute positively or inhibit the dynamization of the sector

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B.2.6. Methodology I Project Methodology I Deductive Reasoning

COULD THE JEWELLERY AND WATCH SECTOR BE DYNAMIZED THROUGH A SHARED VALUE APPROACH BY CONTRASTARIA?

Yes

Why?

EXTERNAL

Opportunities

Increasing digitalization: Current tendencies towards more digital services and offerings

Increasing demand: The jewellery and watch retailers' business volume is expected to grow until 2025, following consumer demand

High exportation acceptance rate: Portugal currently exports to several international markets such as China, USA, France and Spain. Exportations are expected to grow to 15% in 2022

Sustainability potential: The small scale of the Portuguese Jewellery and Watch Sector, combined with the production in scale and mostly artisanal, allows for a fast transformation regarding sustainability

Threats

Popularity of tags: The acceptance of hallmarking tags, a more efficient hallmarking process can lead to a possible loss of customers

Dependence on large clients and on the state of the economy: Large clients have a high bargaining power and the macroeconomic environment impacts the sector's demand

Poor knowledge about end-consumers: The insufficient contact with the end-consumer leads to a lack of knowledge about their preferences and purchasing habits

Unofficial services: International Assay Offices are becoming more competitive with the introduction of innovative unofficial services

INTERNAL

Strengths

Know-how: The assaying and hallmarking business in Portugal has been handed over to INCM since 1882, allowing for the development of specialized know-how in the area

Exclusivity and obligation: Only INCM is authorized to carry out this activity in Portugal and every precious metal item introduced in the market is required to be hallmarked

Credibility: By being the only entity in Portugal responsible for hallmarking, the institution is seen as highly reliable and credible

Work Force: Contrastaria possesses a family-like environment, where efforts for constant improvement are notable

Weaknesses

State Business Sector (SEE): the activity developed by the INCM is covered by the measures defined for companies from the SEE, stipulated in the State Budget Law, which guides its performance in different areas

Lack of complementary service offerings: Contrastaria currently offers mainly core services to the business, creating space for the inclusion of additional services (e.g. valuation services)

Lack of innovation: The lagging innovation leads to this being an outdated sector and creates the need to dynamize the Assay Office's operations and processes

Source: Team based

Contrastaria is able to reach its end goal through the implementation of both a communication strategy and the digitalization of processes, which will increase awareness and improve the company's internal operations

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B.2.7. Methodology I Project Methodology I Inductive Reasoning

THEREFORE, CONTRASTARIA COULD DYNAMIZE THE JEWELLERY AND WATCH SECTOR

How?

COMMUNICATION STRATEGY

Physical

The physical purchasing points are still crucial for the consumer due to the close service as well as the higher degree of security they offer. For that reason, Contrastaria could utilize this channel for its communication strategy

Flyers and Cards: By offering an informative flyer or displaying a card on the counter of the physical store, the buyer can be introduced to this form of consumer rights protection, increasing awareness and raising interest

Tags: Having a small, straight-forward reference to Contrastaria on the price tag of the item, would allow consumers to be more aware about the subject and prioritize certified products

Digital

Social Media and TV: Advertising campaigns will offer a direct contact between Contrastaria and the end-consumer. Each form of communication will target a type of consumer, adapting the message to the target and the communication channel used. The goal is to maximize reach and capture the consumer's attention, creating a desire to learn more about the subject and enhance both the value attributed to hallmarks and Contrastaria's notoriety

Website Reference: Standardizing the reference of hallmarks and Contrastaria on retailers' websites will increase attention of consumers towards hallmarks

DIGITALIZATION OF PROCESSES AND SYSTEMS

Processes

Internal Processes: Contrastaria's current processes are based on the constant use of paper and outdated techniques. Therefore, and to follow current digitalization trends, Contrastaria should focus on digitizing its internal processes with the aim of achieving efficiency, and thus a higher customer satisfaction

Chatbot: Contrastaria's client services are currently not satisfying customers' needs. There are several unanswered calls every day from clients with questions to ask. Therefore, having a chatbot on Contrastaria's website, would help the company in answering all its clients' doubts with efficacy

Systems

Digital Certification: The major problem regarding online shopping is the increasing number of counterfeits. To tackle the problem, Contrastaria should create a digital certification to guarantee the authenticity of the precious metal items sold online, and thus protect consumers and promote loyal competition

Feedback Collection: Contrastaria's current feedback collection system is lacking innovation and efficiency. Therefore, the use of digital means to collect client's feedback, such as online surveys distributed through Contrastaria's website and tablets, will allow Contrastaria to reinvent itself while responding to consumers' wants

Source: Team based

Through a thorough analysis,, using relevant tools and frameworks, several hypotheses were created and later tested, whose validation act as the basis of the recommendations presented later on to the Client

B.2.8. Methodology I Project Methodology I Hypotheses Analysis

ISSUE	SUBISSUE		HYPOTHESIS	ANALYSIS
Physical advertising	Should Contrastaria use physical selling points to distribute informative instruments to consumers in order to create awareness amongst consumers?	Such as Flyers Such as Cards Such as Price Tags	**Yes.** Informing clients during the physical purchasing act by distributing informative instruments would boost consumers' awareness regarding their rights as a precious metal item buyer	• Secondary Data • Quantitative Surveys • Qualitative Interviews • P&L Analysis • Benchmarking and BPs analysis
Digital advertising	Should Contrastaria leverage the reach of digital advertising to create awareness amongst consumers?	Through Social Media Through a TV report Through TV commercials	**Yes.** Using online and digital means of promotion has been proved to be effective in raising awareness in several topics	
	Should Contrastaria create awareness amongst online consumers by standardizing the reference to Contrastaria's certification on retailers' websites?		**Yes.** A more standardized form of referring to Contrastaria on retailers' websites will increase consumer awareness and create the need of finding information displayed when looking through a website	
Process	Should Contrastaria decrease the use of paper in their internal operations by implementing dashboards through tablets and TV screens?		**Yes.** Besides the negative environmental impact, using paper can lead to human errors when processing orders. A dashboard will enable an efficient communication between the different sections in a more digital and reliable manner	• Environmental impact • P&L Analysis • Secondary Data • Expert interviews
	Should Contrastaria implement a chatbot in its website in order to chat with customers in real time?		**Yes.** Having a chatbot will allow Contrastaria to deliver a high-quality and efficient customer service	
Systems	Should Contrastaria create a digital certificate to protect online buyers from counterfeits and foster loyal competition among Economic Operators?		**Yes.** Creating a digital certification to guarantee the authenticity of a precious metal item would protect online buyers from forgeries, fostering online rights	• Qualitative Interviews • Expert interviews
	Should Contrastaria offer easy and accessible forms of gathering feedback to enable continuous service improvement and tighten the relationship with clients?		**Yes.** Collecting feedback is a vital way for Contrastaria to be able to respond to clients' needs as well as forecast future needs, by improving their services, and thus build tight relationships	

Source: Team based

To understand the internal and external ecosystem to Contrastaria's business and study the formulated hypotheses, business frameworks, qualitative data and quantitative data were explored

DEDUCTIVE REASONING		INDUCTIVE REASONING
Internal	External	Porter's Value Chain Model
SWOT and TOWS	STEEP	McKinsey 7S Model
Porter's Value Chain Model	International Assay Offices Best Practices	Business Model Canvas
Economic Operators' In-depth Interviews	Creating Shared Value Best Practices	International Assay Offices and Creating Shared Value Best Practices
Company's Internal Data	In-depth Interviews and Surveys	Eisenhower Priority Matrix

SOURCES

Primary Data				Secondary Data					
Qualitative		Quantitative							
End-consumer In-Depth Interviews (10 interviewees)	**Economic Operators' Interviews** (8 interviewees)	**End-consumer In-depth Survey** (534 answers)	**Communication Strategy In-depth Survey** (310 answers)	**Contrastaria's Internal Data**	**Benchmark Analysis**	**Industry Reports**	**Shared Value Best Practices**	**Financial Data** (Orbis)	

Source: Team based

The business model canvas was applied to fully understand Contrastaria's business model, through the validation of the company's key elements and consequent analysis of how they are linked together

THE BUSINESS MODEL CANVAS

- The Business Model Canvas, developed by Osterwalder and Pigneur (2011) is an extremely important tool, which systematically works through the **fundamental blocks of a business**, mapping all the key elements and activities that a specific company is exploiting. The Business Model Canvas is normally the first step to be addressed when launching an idea or any initiative, allowing to **fully understand the business idea** and **how it will be positioned in the worldwide markets.**
- All the information incorporated into the Business Model **is seen as assumptions and hypothesis**, which, in order to validate and completely check each block**, are required to be tested into the market, analysing the market needs and/or wants.** This model is divided within 9 major elements, which are required to be validated and analysed individually: **Key Partners; Key Activities; Key Resources; Value Proposition; Customer Relationship; Channels; Customer Segments; Cost Structure; and Revenue Streams.** Moreover, this illustrative model is constantly changing and adapting, being linked with business changes, which implies that **this is a constant work in progress**

KEY PARTNERS

- Government, the Jewellery Advisory Board and AORP

KEY ACTIVITIES

- The most important activities are Hallmarking and Laboratory Testing/Assaying, complemented by unofficial services

KEY RESOURCES

- Materials for the Hallmarking procedure, technology and chemicals for laboratory testing, customized software, complemented by a highly skilled staff

VALUE PROPOSITION

- Ensure customer's rights and safety while fostering loyal competition, always delivering an efficient and collaborative service

CUSTOMER RELATIONSHIP

- Close customer relationship based on trust and constant efforts for improvement

CHANNELS

- Contrastaria has 3 Assay Offices, Lisbon, Porto and Gondomar. Moreover, items can be sent and received through the transportation service

CUSTOMER SEGMENTS

- Contrastaria serves Economic Operators directly, such as retailers, manufacturers, artists and distributors, while protecting the end-consumer

COST STRUCTURE

- Materials for Hallmarking, such as punches or X-Ray machines, Staff and Administration, Utilities, and Software costs

REVENUE STREAMS

- All the services provided by this institution have a cost associated. Revenues are mainly generated by the assaying and hallmarking services

Source: Osterwalder and Pigneur (2011)

To collect concrete data from end-consumers and Economic Operators, surveys and interviews were conducted. These facilitated the identification of Contrastaria's opportunities to create value for both stakeholders

B.2.9. Methodology I Project Methodology I Research Methodology (III/V)

The end-consumers' in-depth interviews, the Economic Operators' in-depth interviews and both surveys, were gathered on pre-established criteria:

1. No age limitation or restriction; 2. Residents in Portugal; 3. No gender restriction; 4. At least one of each Economic Operator category

Type	Method	Sample	Description
Qualitative	**End-consumers In-depth Interviews**	10 Interviews	Open-ended questions aiming at gathering detailed information regarding the Portuguese society's perceptions on the Jewellery and Watch Industry, buyers' consumption behaviours and knowledge regarding Assay Offices, Hallmarking, and Contrastaria's Mission
Qualitative	**Economic Operators' In-depth Interviews**	8 Interviews	Open-ended questions aiming at understanding the internal perspective of the Jewellery and Watch Industry, namely the relationship between Contrastaria and the Economic Operators, and their major pain points. Furthermore, the Team was able to comprehend Contrastaria's feedback system collection, and Economic Operators' perceptions on the sector conditions. Lastly, several suggestions of initiatives were highlighted by the interviewees to improve Contrastaria's services and offerings
Quantitative	**End-consumer In-depth Survey**	534 Answers	Quantitative questionnaire aiming at understanding consumers' behaviours and perceptions on the Portuguese Jewellery and Watch Industry, and overall awareness regarding Contrastaria's operations and Mission
Quantitative	**Communication Strategy In-depth Survey**	310 Answers	Quantitative questionnaire focused on comprehending consumers' perceptions regarding the effectiveness of several communication methods in raising Portuguese population's awareness about hallmarks and Contrastaria's mission

Source: Team based

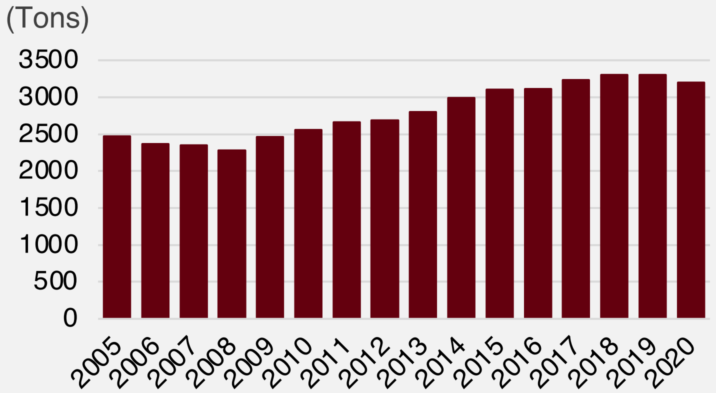
The mining activity of gold and silver have been behaving in a similar manner, displaying a steady increase after the 2008 economic crisis, while platinum has been decreasing ever since

CONTRASTARIA

C.2.1. Analysis I External I Industry Overview (I/V)

Mining Activity | Production of Precious Metals | Production and Importation of Artefacts | Certification and Control | Retail of Artefacts

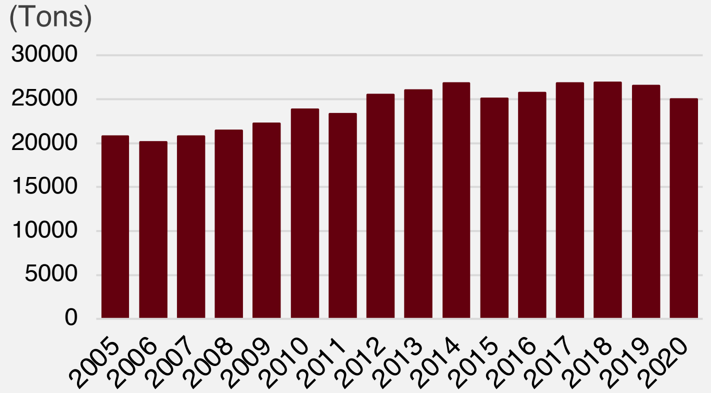
Global Mining Activity of Gold



Graph VIII: Global Mining Activity of Gold, from 2005 to 2020
Source: Statista (2021)

- Global gold mining activity has **steadily increased** after the 2008 economic crisis
- In 2008, production totalled 2,280 tons and has increased by more than three thousand tons each year since 2015
- **China** currently **leads the gold mining** activity with around 420 tonnes in 2019

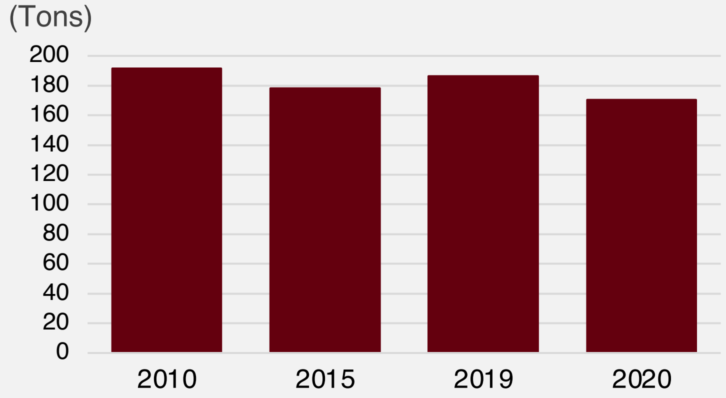
Global Mining Activity of Silver



Graph IX: Global Mining Activity of Silver, from 2005 to 2020
Source: Statista (2021)

- Likewise, the silver mining activity has been **increasing in general terms**, while the estimated silver mining activity in 2020 was 25,000 tons
- The top three silver producing countries in 2019 were **Mexico, Peru and China**
- In the same year, Mexico produced 190.3 million ounces, Peru produced 135.4 million ounces and China produced 110.7 million ounces

Global Mining Activity of Platinum



Graph X: Global Mining Activity of Platinum, from 2010 to 2020
Source: Statista (2021)

- The estimated global platinum mining activity has been **decreasing** since 2010, amounting the total 170 tonnes in 2020
- **South Africa** is the largest producer of platinum in the world, producing around 120 tonnes annually
- Russia ranks second with an output of around 21 tonnes per year

Source: Statista (2021)

The main players in precious metals production were China, Mexico and South Africa. Moreover, the price of gold has fallen, while the one of silver and platinum rose, reflecting the widespread use of metals in industry

CONTRASTARIA

C.2.1. Analysis I External I Industry Overview (II/V)

Mining Activity | **Production of Precious Metals** | Production and Importation of Artefacts | Certification and Control | Retail of Artefacts

Global Search for Gold
(Tons oz)

4 333 (2015) → -15,2% → 3 759 (2020)

The global demand for gold corresponded to around 3,759 tons in 2020, **a decrease of approximately 14%** compared to the previous year, as a result of the global pandemic

Global Search for Silver
(Million oz)

1 070 (2015) → - 19,4% → 896 (2020)

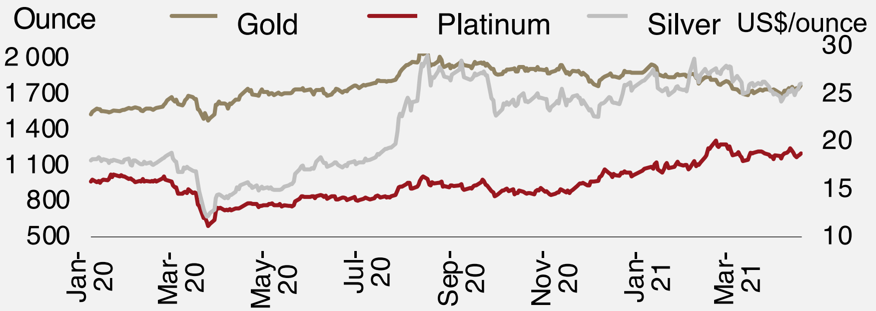
The global demand for silver amounted to 896.1 million ounces;
The global forecast for 2021 will be 1.03 billion ounces

Global Search for Platinum
(Thousands oz)

7 942 (2015) → - 8,4% → 7 330 (2020)

Global demand for platinum corresponded to 7,330 thousand ounces in 2020 and is expected to reach 7,400 thousand ounces in 2021

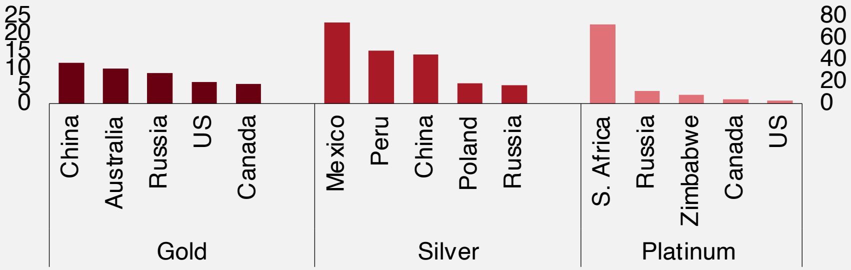
Price Evolution of Gold, Silver and Platinum



Graph XII: The Evolution of Precious Metal Prices, since January 2020
Source: The World Bank (2021)

- **Gold prices fell slightly as high real interest rates led to investments in Gold ETFs.** Higher real yields make gold less attractive to investors. Physical demand is recovering but remains below pre-pandemic levels
- **Silver prices rose by 8% in Q1 of 2021 to its highest level in 8 years,** due to the industrial demand (electronics, solar power, and others), accounting for more than 50% of silver consumption
- **Platinum prices also rose by 24% mainly due to industrial demand.** Jewellery demand fell, while auto manufacturing increased. The use of platinum was boosted in consequence of new regulations regarding emissions in China and Europe

Top precious metals producers, in 2019
(% of global production)



Graph XI: Top precious metals producers, in 2019
Source: The World Bank (2021)

- In the production of Gold, **China stands as the leader (12%)**
- In the production of Silver, **Mexico is the main player (23%)**
- Finally, in the production of platinum, **South Africa stands out, being responsible for 72% of global platinum production**

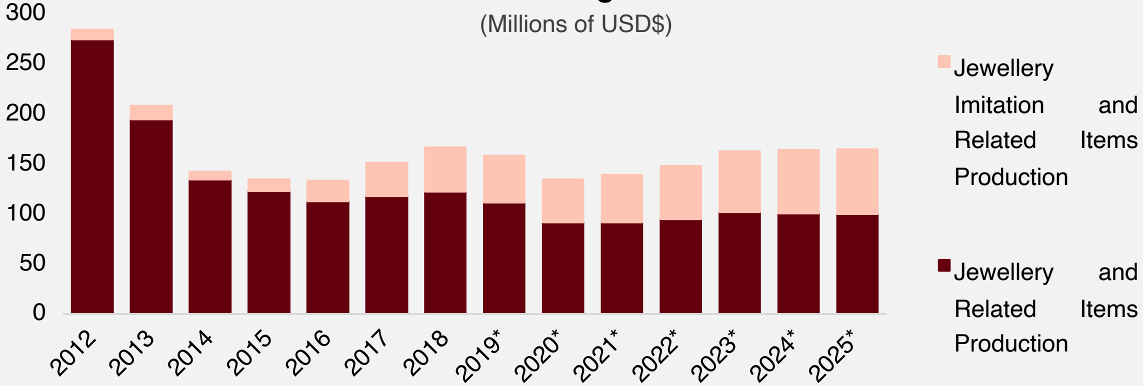
Source: Statista (2021), The World Bank (2021)

After the economic crises of 2008, both the turnover and the number of existing jewellery producers started to decline, only reversing this trend from 2014 onwards

C.2.1. Analysis I External I Industry Overview (III/V)

Mining Activity | Production of Precious Metals | **Production and Importation of Artefacts** | Certification and Control | Retail of Artefacts

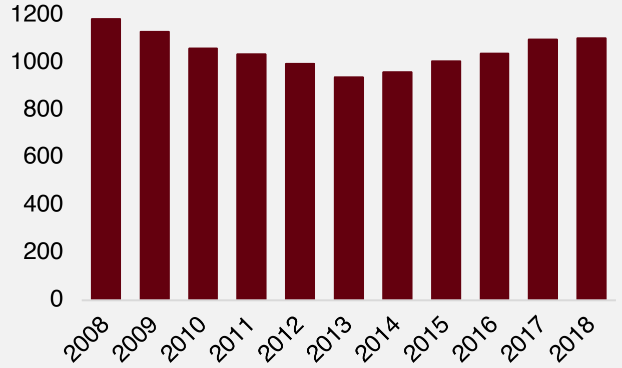
Turnover of Companies Manufacturing Jewellery and other Jewellery items, in Portugal



Graph XIII: Revenues from the "jewellery and other jewellery items" industry, in Portugal, from 2012 to 2025
Source: Statista (2021)

- **The turnover of jewellery and other jewellery manufacturing** companies has shown a decrease since 2012
- However, **the estimate for the coming years** is a **slight growth both in the turnover of jewellery and related articles**, as well as their respective imitations, in Portugal
- The growth of the Imitations Jewellery Market is **a concern for the industry as a whole**, being one of the main issues that has to be dealt with in the near future. The Portuguese Assay Office's role is then essential to control and supervise this growing market

Number of Jewellery and relating Articles Producers, in Portugal



- As a **result of the economic crisis of 2008**, the number of companies producing jewellery and related articles **decreased significantly**
- However, after 2013 there was a **continuous increase**, with 1,101 producers in 2017

Graph XIV: Evolution of the number of companies producing jewellery and related articles in Portugal, from 2008 to 2017
Source: Statista (2021)

Potential Source of Competitive Advantage for the Portuguese Jewellery Production Industry

- According to *Jornal Económico,* **the Portuguese Jewellery and Watch Industry as an example of sustainability can be an important differentiating factor**
- Portugal has a **small-scale industry**, organised in **clusters**, with a large scale and mostly **artisanal production**. These conditions allow a **rapid transformation** of the industry, both of **practices and mentalities**

Source: Jornal Económico (2021), Statista (2021)

The Portuguese Assay Office has been focusing on creating clusters and new services, being more agile, and developing legislation to foster the sector

C.2.1. Analysis I External I Industry Overview (IV/V)

Mining Activity → Production of Precious Metals → Production and Importation of Artefacts → **Certification and Control** → Retail of Artefacts

Assaying and Hallmarking Value Chain

1 Artefact Reception — 2 Assaying — 3 Hallmarking — 4 Delivery/ Collection

1. **Artefact Reception:** The journey of a jewellery artefact starts with the delivery of the piece by an Economic Operator or the respective representative. The article is then delivered, weighted, and the fee is charged for the chosen services
2. **Assaying:** The article then goes to the laboratory to be tested and to verify the precious metal pure content
3. **Hallmarking:** After being assayed, the artefact is hallmarked. The techniques used usually are stamping or laser engraving. In some specific situations, the Assay Office can use tags instead
4. **Delivery/ Collection**: Finally, the piece is ready to be delivered to the Economic Operator

Portuguese Assay Office Trends

1. Cluster Creation

Contrastaria has been moving towards the creation of **clusters and communities** that allow the contact between the producer and the direct consumer, stimulating **proximity** and the act of purchase

2. Agility and Convenience

The Industry has been streamlining processes in order to **deliver efficiency** to the customer as quickly as possible, reducing the time spent by the customer and increasing their satisfaction

3. New Services

To guarantee maximum safety for customers in the transport of articles, **new services** are being created for the **collection and delivery of the artefacts**

4. Legislation

The increase in legislation in this industry is seen as **something regular** given the need for proof by government entities

Associação de Ourivesaria e Relojoaria de Portugal (AORP)

AORP is a national business association founded in 1945 that **represents the Jewellery and Watch Industry**, covering its various areas of activity: industry, retail, wholesale and other related activities

AORP's mission is to **represent, support and defend the interests of its member companies**, having as main areas of intervention:

- Juridical support
- Financial consultancy
- Support to internationalization
- Communication and image consultancy

AORP also contributes to the **promotion of Portuguese Jewellery and Watch Industry** at both national and international levels, through the creation and development of joint actions in markets considered strategic for the internationalization of the sector

Source: AORP (2021), Team based

An increase in the turnover is expected in the near future, accompanied by the growth of Portuguese artefacts' exports to substantial markets such as China, USA, France, and Spain

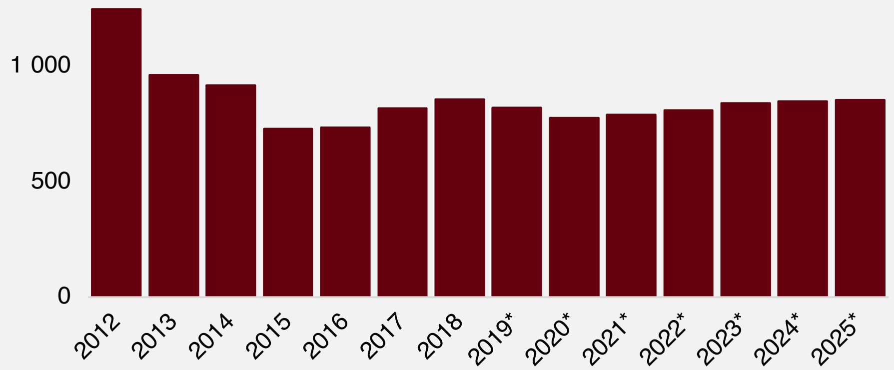
CONTRASTARIA

C.2.1. Analysis I External I Industry Overview (V/V)

Mining Activity | Production of Precious Metals | Production and Importation of Artefacts | Certification and Control | **Retail of Artefacts**

Turnover in the retail trade of jewellery and watches in Portugal

(Million of USD$)



Graph XV: Revenue from the "retail sale of watches and jewellery" in Portugal, from 2012 to 2025
Source: Statista (2021)

- After a continuous decrease since 2012, the turnover of the retail trade on the **Jewellery and Watch Industry has been growing until 2019**
- Despite the decline in 2020 due to the world pandemic, the turnover **is expected to slightly grow until 2025**
- Such growth is accompanied by the **growth of the turnover of jewellery and watches manufacturing companies**

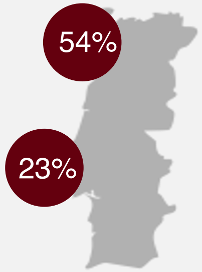
According to the National Institute of Statistics (INE), in 2015:

4,237 companies in the sector

3,339 (business)

655 (manufacture)

243 (repair)



- The sector has **3,339 jewellery and watches retailers**, with an evident presence in the North of Portugal
- More than 50% of the jewellery value chain is concentrated in **clusters in the North of the country**, while only 23% is located in the Centre

Exports of Portuguese Artefacts

- Portugal currently exports to several markets (China, USA, France, Spain), **displaying a high rate of acceptance and some growth**
- The onset of the crisis reinvented the Jewellery and Watch Sector, **projecting it towards internationalization,** where Spain, France and the USA occupy the top of the list
- It is estimated that by 2022, **exports will rise to 15%** (compared to 10% in 2019) of total business volume

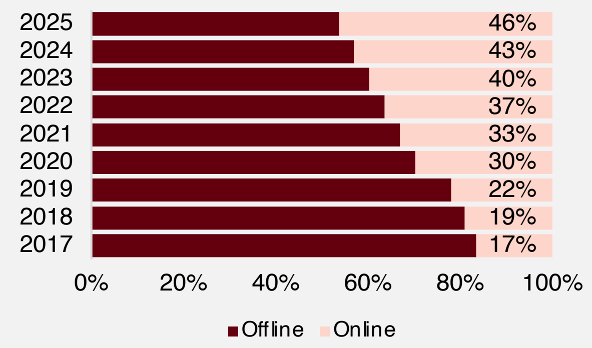
Source: Diários de Notícias (2019), GDAE (2018), Statista (2021)

The current consumer demand is characterized by an increasing interest in online platforms while showing concerns towards sustainability and societal issues

C.2.4. Analysis I External I STEEP (I/V)

SOCIAL

- The Portuguese e-Commerce market is expected to **continue to grow** over the next few years
- The revenue in 2020 amounted the total of almost **$4 million**, with a predicted compound annual growth rate (CAGR) of 8%
- In 2020, the online penetration of 47% suggests some **saturation of the market,** as 47% of the Portuguese population have made at least one online purchase
- In the same year, the increase of 30% (YoY growth rate), the Portuguese e-Commerce market contributed to the **worldwide growth rate of 29%**



Graph XXV: Portuguese Retailers Revenue Sources Estimation
Source: Statista

- It is predicted that the **online source of revenues** of jewellery retailers will **continue to grow** for the next few years, and equal the offline revenue source weight, which shows the increasing demand for online jewellery shopping

- The Jewellery and Watch Industry has been **slow to implement market-wide changes** in terms of sustainability, only doing it to mitigate some scandals
- Only 12% of baby boomers are willing to pay more for **sustainable jewellery products**. However, **this number almost triples** to 31% regarding Gen-Z consumers
- Moreover, in 2019, 58% of younger luxury goods consumers stated that **sustainability is an important factor in their purchase decision**
- A McKinsey study indicates that 9 out of 10 Gen-Z consumers believe firms do have **responsibility in addressing environmental and social issues**
- **Regulatory standards are starting to emerge** in this sector to foster practices related to sustainability, such as the Conflict Minerals Regulation in the European Union (EU), in 2021, to ensure responsible sourcing of minerals (for example, of gold)

INDUSTRY IMPACT

- The e-Commerce Market's growth and respective increasing demand of online shopping can be seen as an **opportunity for both retailers** to raise their online presence but also **for Contrastaria** to supervise such operations, always protecting the end-consumer
- Operating in a more sustainable manner can be seen as a potential source of **competitive advantage** in the post-pandemic period as the world's economy recovers, **fulfilling consumers' demand and anticipating future regulation**
- This demand will foster brands' **engagement with sustainable and societal issues** in the future, through **ambitious commitments and clear evidence of progress**

Source: eCommerceDB (2021), Statista (2021), The Business of Fashion (2021)

As a result of the increasing demand for online shopping, the number of cyber attacks have been increasing. Moreover, the technological improvements both in products and industry processes will strongly impact the industry

C

CONTRASTARIA

C.2.4. Analysis I External I STEEP (II/V)

TECHNOLOGICAL

- In Portugal, the **total number of cyber attacks increased by 17%,** in 2020
- The country was a victim of **22,818 malware attacks**, in January 2021, which totalizes **31 outbreaks/hour**

20%	**27%**	**33%**
Smartwatch Sector Growth YoY	Apple Watch MS Growth in Q2 2021	Swiss Watch Industry Decline in 2020

- The smartwatch sector **is growing at approximately 20%** YoY
- Apple is the most sold smartwatch, holding over **33% of the market share**, with the next competitor at 8%
- The wider Swiss watch industry suffered a **decrease of 21% in value and 33% in volume in 2020**

- Technological advancements have been reflected in the Jewellery and Watch Industry in the shape of more **modern, bold and quality pieces**, attracting customers
- New jewellery consumers demand pieces that **are more than just an accessory, they want jewellery with purpose**. Jewellery producers design their products so that they can be used together with electronic devices. ***Ringly*** has created smart bracelets and rings that connect to mobile devices so that consumers measure their activity, and never miss social media updates
- However, several of these companies that have combined jewellery and technology **have struggled to survive**. Unless you are selling Apple products, it becomes **difficult for any wearable tech to sustain its business**

Several Assay Offices have been focusing on an **innovation strategy** that allows for greater efficiency in processes, as well as the supply of new services, such as:

- **Quick Nickel Test**: evaluates the possibility of nickel release in parts in contact with the skin, reducing the time and cost of this type of test
- **Help with Hallmarks:** the application developed by the Birmingham Assay Office, allows you to quickly search and identify different symbols
- **Assay Assured**: the Edinburgh Assay Office launched the world's first and only online trust system for jewellery e-tailers with an Assay Office guarantee. The system protects online shoppers from imitations while helping brands gain consumer trust

INDUSTRY IMPACT

- The growing smartwatch sector stands as a **threat to the Jewellery and Watch industry**, as consumers are moving towards a more **digital product** rather than the classic gold or silver products
- The rising development of companies combining jewellery with technology, expresses an on-going industry trend of **creating pieces with purpose**. Thus, the Portuguese Assay Office might have to create **new legislation and techniques** to manage this
- On the other hand, other Assay Offices are incorporating **unofficial digital services** that boost their **services' efficiency** while tightening their **relationship with consumers**. Nevertheless, one must be careful when offering these solutions as cyber attacks can become a potential risk

Source: Birmingham Assay Office (2021), ComputerWorld (2020), Edinburgh Assay Office (2021), Sheffield Assay Office (2021), SlideBean (2021), SJX (2021), Tecnogold (2019)

The precious metals market has been shrinking during the last couple of years, while the Imitation Jewellery Market has been growing, showing the need for more developments inside the industry to protect the consumers

CONTRASTARIA

C.2.4. Analysis I External I STEEP (III/V)

ECONOMICAL

- After a **continuous increase in gold, silver and platinum mining activity** after the 2008 crisis, there was a drop from 2019 to 2020
- In 2019, the precious metals market in Portugal presented a total value of **2.86 million euros**
- The turnover of artefact manufacturing and retailing companies is expected to increase in the coming years
- There was a **decline in gold prices**, but an increase in silver prices

- According to INE, **domestic demand** was particularly affected in 2020, recording **a reduction of 4.7%** in real terms
- Yet, a recovery is expected in 2021 and the **re-establishment of the pre-pandemic crisis levels by the end of 2022**
- The Jewellery and Watch Market **is recovering from the 2020's pandemic**, as Q3'21 demand was 33% higher than Q3'20
- However, even though the demand for jewellery has made a solid recovery, it remains below average pre-COVID levels
- In Europe, the re-opening of the national economies after lockdown was the **leading growth driver**, even though tourists have remained largely absent, removing potential demand

Imitation Jewellery Market

2019 WORLD TRADE	2019 TOP EXPORTER
$6.6B	2.46B CHINA

- Imitation jewellery consists on a variety of materials, such as **metal, plastic, and glass**, that are often used as a **cheaper alternative** to precious metal jewellery
- In 2019, **imitation jewellery** had a total trade of $6.6B
- Between 2018 and 2019, the imitation jewellery's exports **decreased by 1.46%,** from $6.7B to $6.6, representing **0.036% of total world trade**
- In 2019, the leaders in exports of imitation jewellery were China ($2.46B), France ($497M), and Thailand ($401M)
- In the same year, the top importers were the US ($969M), France ($527M), and Germany ($445M)

INDUSTRY IMPACT

- The decrease in mining activity and in domestic demand **affected** the Jewellery and Watch Sector **negatively**
- However, demand is recovering and consequently is **fostering production and retail activity**, and thus demanding a **more efficient service** from the Portuguese Assay Office
- A major concern in this sector is the **size of the Imitation Jewellery Market**. As the main advocate of consumer rights, **Contrastaria needs to intervene.** One of the main reasons consumers buy these products is because they're **unaware**. This usually happens due to the fact that counterfeit channels reach final consumers appearing to be "official" selling points. These are **"deceptive purchases"**, as the consumer is **trusting to be buying one article yet receiving another**

Source: Diário de Notícias (2021), The World Council (2021), OEC (2020), Statista (2021)

The mining activity is the main source of environmental and social harm, however, the introduction of sustainable processes, new environmentally-friendly business models and second-hand precious metals can be the answer

C.2.4. Analysis I External I STEEP (IV/V)

ENVIRONMENTAL

- The challenges regarding environmental issues start by the **very first stage** of the precious metals value chain, the **extraction** of gold, silver, palladium and platinum
- Modern gold mining techniques are currently **displacing tremendous amounts of soil** in order to extract gold. For example, in order **to collect a few grams** of precious metal, it is necessary to remove, on average**, 20 tons of soil**
- Furthermore, the environmental impact goes beyond just the mining site, the **use of chemicals** can cause **soil erosion** and the development of sinkholes **put in danger the region's biodiversity** and **contaminate the soil**
- Additionally, the mining activity has a **negative impact on local communities,** since the high degree of pollution leads to health issues. Miners are also highly impacted as these are constantly exposed to airborne respirable dust which can cause respiratory diseases

- Boryana Straubel, founder of the **Generation Collection**, has been acting as an activist in order to change and shift the Jewellery and Watch Industry. Straubel is investing 2 million dollars to launch a jewellery brand only focused on the recycling process of 24K Gold. Her mission consists in **"Turning Waste into Gold".** Following the numbers and analysis shared by the company, the environmental footprint avoided by recycling artefacts of gold is:

Recycled 19 grams gold ring = 686 Kg of Co2 avoided | 12,998 Litters of water saved | 1,225 kW of energy waste saved

- By being a circular economy, the reused gold can be reused again, never breaking the cycle, in perpetuity. The best gold and platinum recyclers in the world can **reduce the negative impact on the environment by 99%** when compared to conventional production methods
- Furthermore, **technological advancements** were crucial for the mining industry's growth, since precious metal items were introduced in secondary products, after new applications for them were discovered

INDUSTRY IMPACT

- **Producers and manufacturers are beginning to seek sustainable processes,** as the world is looking for ways to **reduce carbon footprint**, due to external pressures from national and international regulators, and increasingly concerned consumers
- Moreover, the industry is moving towards **second-hand precious metals,** reusing materials in order to produce new artefacts. Brands and firms have been adapting to the process of **refining metals**. It is then possible to reduce the environmental impact associated to the production of precious metal items
- As a result of these new innovation-oriented strategies, some **start-ups are emerging** and further including environmentally friendly processes in their operations

Source: Euronews (2021), Generation Collection (2021), Vogue Business (2021)

The strong and growing regulation of the sector tries to foster loyal competition while minimizing the Imitation Jewellery Market, which has been growing significantly

C.2.4. Analysis I External I STEEP (V/V)

POLITICAL-REGULATORY

- The activity of Assay Offices and industry's Economic Operators **are highly regulated.** In Portugal, some examples of the regulations imposed in the Portuguese Jewellery and Watch Industry include:
- **Portaria n.° 173/2020** (17/07) amends Portaria n.° 403-B/2015 (13/11), with regard to the fees due in the legal regime for jewellery stores and assay offices
- **Portaria n.° 374-A/2017** (31/10) indicates which stamps are applicable by the assay offices, the provisions applicable to testing and hallmarking, and the technical requirements precious metals articles
- **Portaria n.° 333-B/2017 (3/11)** – Regulates the New Legal Regime for Gold Smithery and Assay Offices, approved by Decreto-Lei n.° 120/2017
- Moreover, it is crucial to mention the syndicate for the industry, **AORP**, whose responsibility and mission consists in representing, supporting and defending the interests of its member companies, while also promoting the Portuguese Jewellery and Watch Sector

- However, even though the market is extremely regulated in most of the countries where Assay Offices operate, **the secondary and parallel market has been growing drastically over the last years**, avoiding regulation and any type of security regarding certification, testing or even credibility by the materials used
- Boy Ogden, the founder and current President of the Society of Jewellery Historians, estimates and believes that **about 50% of the "antique" gold jewellery on the market is actually fake**
- The World Trade numbers for the Imitation Jewellery Industry in 2019 corresponded to:

6.6 Billion$	0,036% of the World Trading	432th/1217th World Trading Ranking

- To reinforce this extreme situation, **the tariffs applied** in almost all of Europe for this kind of product **diverse between 1% and 11%,** putting the European markets as **accessible bridges to introduce counterfeits with a lower price**, when comparing to legitimate real gold, silver, palladium or platinum jewellery items

INDUSTRY IMPACT

- In Portugal, the Jewellery and Watch Sector is **severely regulated**, and these regulations are **constantly being reviewed**
- It is **extremely important** for the Jewellery and Watch Industry to be **strictly regulated since it needs to maintain high standards of credibility and offer consumers a high degree of protection.** Therefore, regulating bodies have been working alongside national Assay Offices and Economic Operators to **fight the growth of the parallel market**
- **Tighter laws and certification requirements** are becoming increasingly necessary to **ensure that the impact of the secondary markets is reduced** as well as the **risk of customers being misled** when purchasing precious metal items

Source: AORP (2021), Client's Internal Data, JCK Online (2021), OEC (2019)

Contrastaria is part of INCM, a state operated company, and the first Assay Offices were created in 1882 in Lisbon and Porto. Later, the Gondomar Assay Office was added to the two existing ones

C.3.1. Analysis I Internal I Company Overview (I/V)

OVERVIEW OF IMPRENSA NACIONAL CASA DA MOEDA

INCM is a public company that resulted from a merge between Imprensa Nacional and Casa da Moeda in 1972

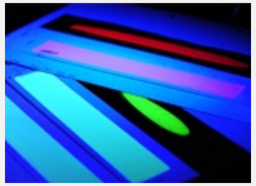
Mission

"To create, produce and supply goods and services that require high security standards, focused on the customer and on innovative solutions"

Activities

INCM is responsible for providing the goods and services necessary for the Portuguese State to function and supply other countries with crucial market products and services. These include:

- Identity and travel documents
- Minting of coins
- Official Publications (*Diário da República*)
- Security Printing
- Essential utilities
- Protect brands
- Identify citizens and goods
- Book Stores
- Graphic Laboratory




OVERVIEW OF CONTRASTARIA

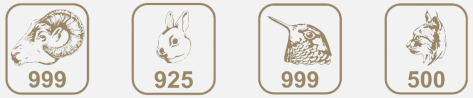
In 1882, the Lisbon and Porto Assay Departments were created and were operated by Casa da Moeda and Papel Selado. Later, in 1913, the Gondomar Assay Office was added to the two existing ones

Mission

"Ensuring consumer safety and trust in the Goldsmith Sector through the certification mark, by promoting an alliance between tradition and innovation"

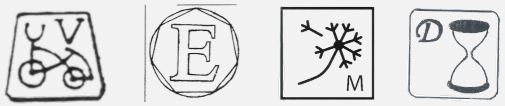
In Portugal, each precious metal item must have at least two hallmarks, namely the **Assay Hallmark** and the **Responsibility Hallmark**. The Assay Hallmark corresponds to the stamp that represents the **type and purity of the precious metal**. The **Responsibility Hallmark**, on the other hand, consists in a unique and exclusive stamp **associated to the Economic Operator** responsible for introducing the item in the Portuguese market

Examples of Assay Hallmarks:



Gold 999% | Silver 925% | Platinum 999% | Palladium 500%

Examples of Responsibility Hallmarks:



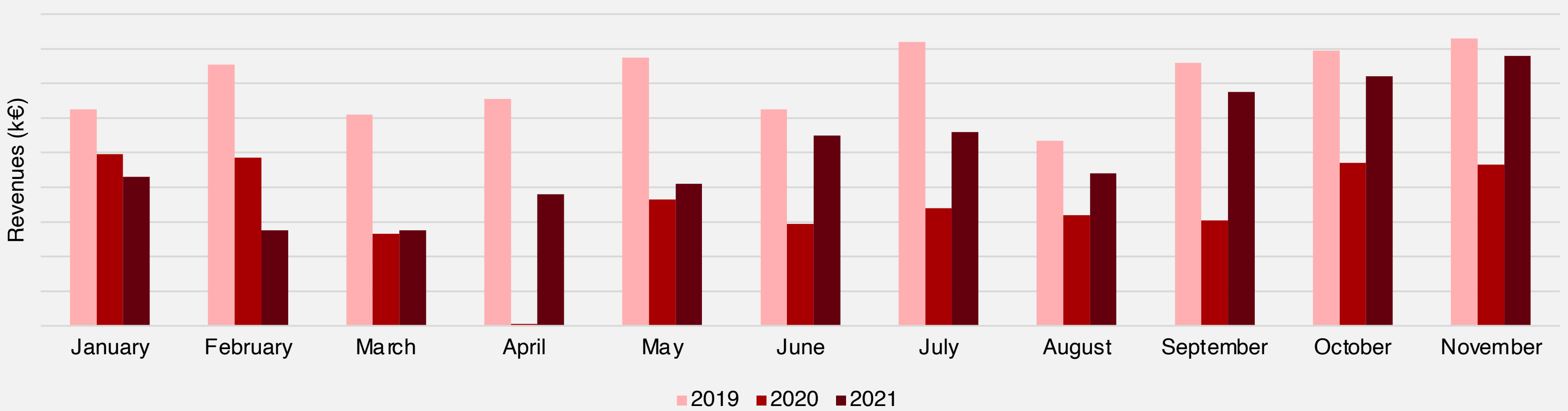
Source: Contrastaria (2021), INCM (2021)

The pandemic had a clear negative effect on Contrastaria's financial results. Although revenues have increased in 2021, the revenue levels of 2019 have still not been reached

C.3.1. Analysis I Internal I Company Overview (II/V)

CONTRASTARIA'S REVENUES

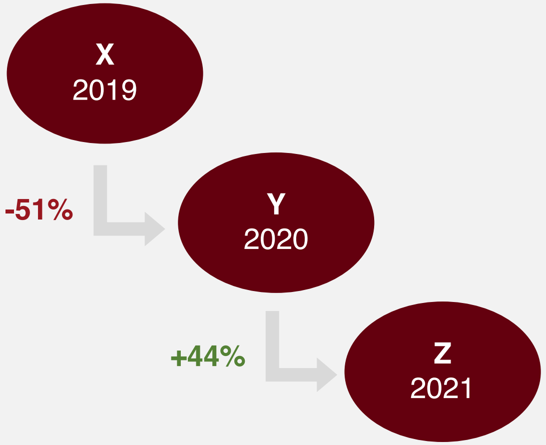
Contrastaria's Revenues between January and November



Graph XXIX: Contrastaria's revenues per month 2019-2021
Source: Client's Internal Data (Numbers deleted due to Client Confidentiality Agreements)

- The results demonstrate that 2020 **was an atypical year due to the effects the pandemic had on different sectors in Portugal.** The vast majority of industries were forced to interrupt their operations **which led to a weaker overall performance.** One consequence was, therefore, **the low levels of revenues Contrastaria presented in each month of 2020 compared to 2019**
- Nevertheless**, the graph shows a significant recovery during 2021**, with revenues **slowly reaching pre-pandemic levels even though values were still low during the first half of 2021.** The **evolution of revenues** has been **extremely positive since August** and, in November, a peak in performance was registered since the beginning of the pandemic
- **Visão do Tempo is Contrastaria's largest client**, being responsible for approximately **14% of the company's total revenues**

Total Revenues (€)



Contrastaria's Top Clients in 2021

1 Visão do Tempo

2 Vitaly EU

3 Neves Costa

4 Bluebird

5 Luís Zagalo

Source: Client's Internal Data

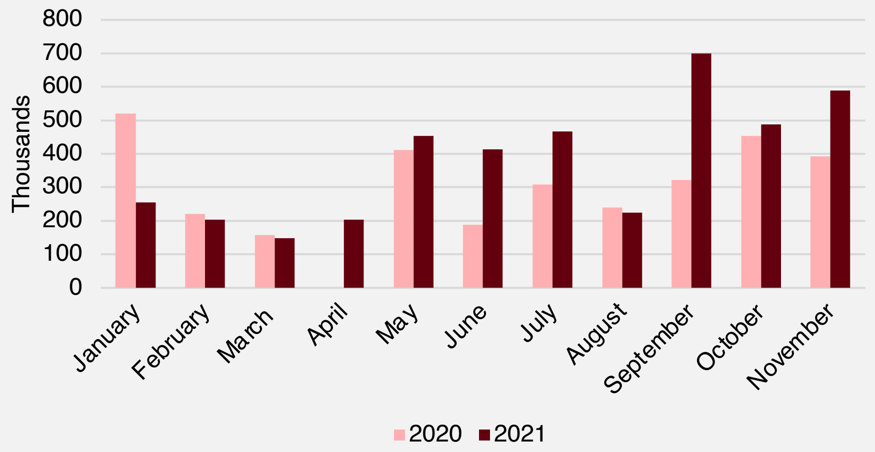
This year, a peak in the items processed was registered in September and the large majority of customers selected the very urgent and express fee types, demonstrating the relevance attributed to the speed of the service provided

C.3.1. Analysis I Internal I Company Overview (III/V)

CONTRASTARIA

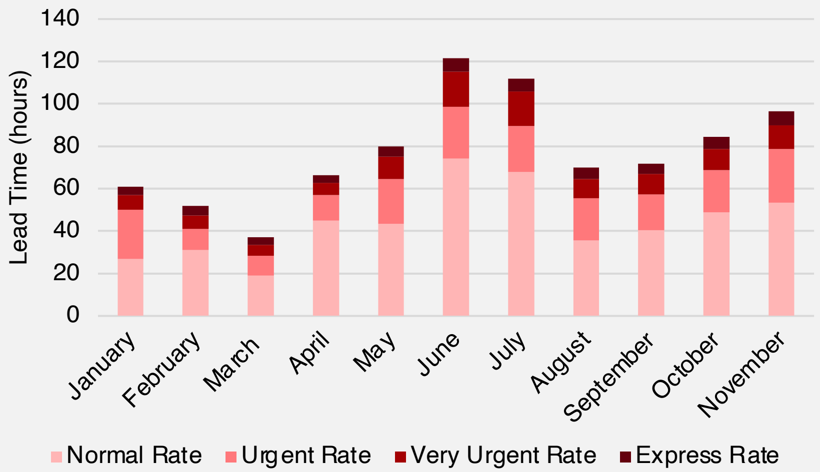
CONTRASTARIA'S GLOBAL RESULTS

Number of Items Processed per Month



Graph XXX: Number of items processed between January and November
Source: Client's Internal Data

Lead Time per Month



Graph XXXI: Lead time per rate type registered between January and November 2021
Source: Client's Internal Data

Average Lead Time

Normal Rate	Urgent Rate	Very Urgent Rate	Express Rate
44.2 hours	18.5 hours	9.8 hours	5.1 hours
5.5 days	2.3 days	1.2 days	0.6 days

- The **number of items** processed **has exceeded the 2020 levels since April 2021**, with the exception of the month of August, where the opposite relationship was registered. During that month Economic Operators are usually out of the office and, therefore, at Contrastaria only permanent workers are operating, leading to the decrease in activity
- The most selected urgency rates for the processing of batches were the **express and very urgent,** which had an average lead time of 5.1 and 9.8 hours, respectively, during the first 11 months of 2021. The selected urgency rates demonstrate **the importance that Economic Operators attribute to the speed of the service**
- In **September**, a **peak in the number of items processed** was registered, nevertheless, it was not the month in which the lead time reached its highest levels for any of the existing urgency rates. The high number of items processed during that month was related to the Economic Operator's return to the office, the organisation of fairs and high number of importations. The registered lead time is a consequence of the high number of imported items which only required assaying and laboratory testing

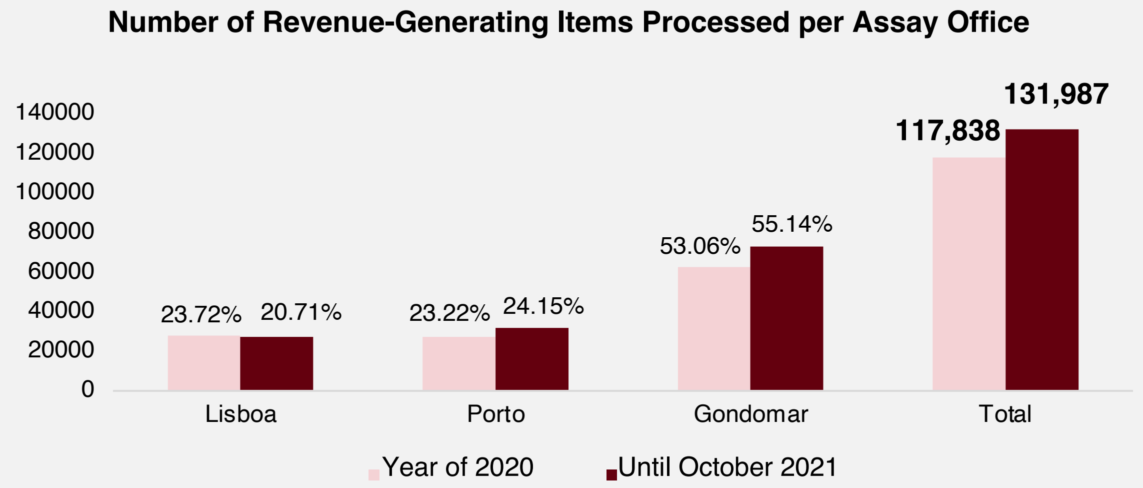
Source: Client's Internal Data

Porto and Gondomar have increased their weight in the total revenue units, while Lisbon has registered the opposite tendency. However, Lisbon and Gondomar stand out for the high number of Economic Operators present in the cities

CONTRASTARIA

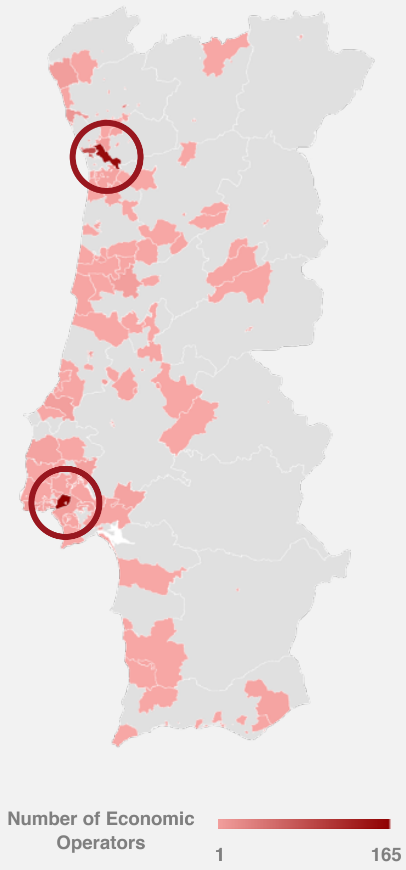
C.3.1. Analysis I Internal I Company Overview (IV/V)

CONTRASTARIA'S REVENUE UNITS



Graph XXXII: Revenue Units from 2020 to 2021
Source: Client's Internal Data

- Lisbon **presents a lower number of revenue units up until now,** while the Assay Offices in Porto and Gondomar **are above Lisbon's revenue levels and exceeding the revenue units registered in 2020**, without considering the Christmas season
- Furthermore, **Porto and Gondomar have increased their relevance compared to Lisbon's Assay Office**
- The information gathered shows that **the revenue billing units registered so far have already reached and surpassed the ones seen in 2020** which is an indication that the industry is recovering after a slow down caused by the pandemic



Graph XXXIII: Number of Economic Operators per city
Source: Client's Internal Data

ECONOMIC OPERATORS

- **Lisbon** and **Gondomar** present the largest number of Economic Operators, 165 and 154 respectively
- Most municipalities have less than 10 Economic Operators and there are 67 with only 1 Economic Operator

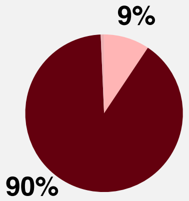
City	Number of Economic Operators
Lisbon	165
Gondomar	154
Porto	90
Vila Nova de Gaia	70
Fânzeres e São Pedro da Cova	47
Guimarães	31
Matosinhos	26
Braga	22
Póvoa de Lanhoso	18
Póvoa de Varzim	18

Source: Client's Internal Data

Industrial and warehouse jewellers stand out in the Portuguese Assay Offices in terms of the number of items assayed and hallmarked as well as the number of attendances

C.3.1. Analysis I Internal I Company Overview (V/V)

Lisbon



Graph XXXIV: Activity type with most items assayed and hallmarked
Source: Client's Internal Data

Industrial Jewellers	9%
Warehouse Jewellers	90%
Artist	0%
Private Individuals	0%
Second-hand retailers	0%
Others	1%

Items per Activity

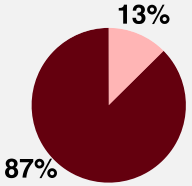
In Lisbon, the warehouse operators stand out, occupying around 90% of the market. The remaining part is dominated by the industrial operators

Industrial Jewellers	41	64%
Warehouse Jewellers	7	11%
Artist	2	3%
Private Individuals	2	3%
Second-hand retailers	1	2%
Retailers	11	17%

Number of Visits per Activity

The Industrial Jewellers (64%) were the Lisbon Assay Office main visitors, followed by Warehouse Jewellers (11%)

Porto



Graph XXXV: Activity type with most items assayed and hallmarked
Source: Client's Internal Data

Industrial Jewellers	13%
Warehouse Jewellers	87%
Artist	0%
Private Individuals	0%
Second-hand retailers	0%
Others	0%

Items per Activity

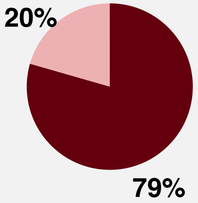
Similarly, in Porto the warehouse operators assay most items, followed by the industrial operators

Industrial Jewellers	126	71%
Warehouse Jewellers	39	22%
Artist	2	1%
Private Individuals	3	2%
Second-hand retailers	2	1%
Retailers	6	3%

Number of Visits per Activity

In Porto, similar to Lisbon, Industrial Jewellers have the most number of visits (71%), followed by Warehouse Jewellers (22%)

Gondomar



Graph XXXVI: Activity type with most items assayed and hallmarked
Source: Client's Internal Data

Industrial Jewellers	79%
Warehouse Jewellers	20%
Artist	0%
Private Individuals	0%
Second-hand retailers	0%
Others	0%

Items per Activity

Gondomar presents the opposite case, where the key industrial operators are the industrial operators

Industrial Jewellers	432	90%
Warehouse Jewellers	42	9%
Artist	2	0%
Private Individuals	1	0%
Second-hand retailers	2	0%
Retailers	6	1%

Number of Visits per Activity

In Gondomar, the tendency remains, with Industrial Jewellers registering the most number (90%) of visits

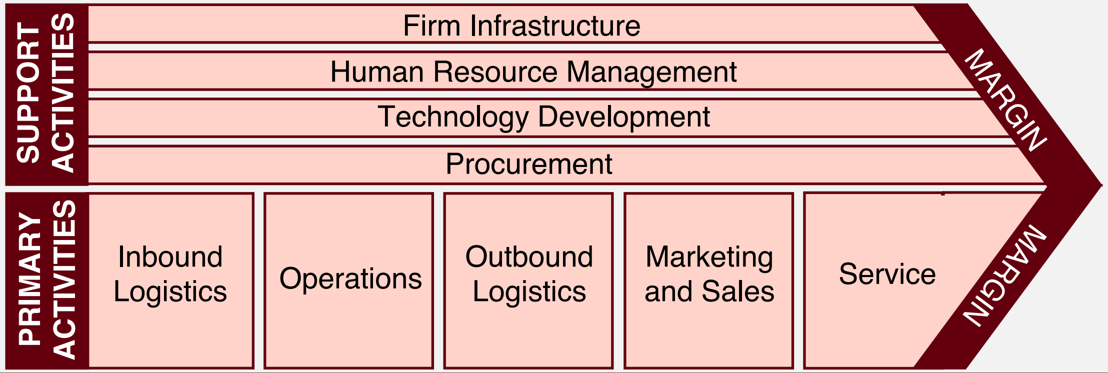
Source: Client's Internal Data

Porter's Value Chain Model offers and overview of the company's activities and how these interact to maximize value for customers. Contrastaria's support activities offer the necessary foundation to ensure efficient primary activities

C.3.2. Analysis I Internal I Porter's Value Chain Model (I/II)

OVERVIEW

Porter's Value Chain Model enables an in-depth understanding of the processes involved in transforming business inputs into outputs, maximizing the value originated from the company's operations. The overview and analysis of the value chain activities facilitates the identification of opportunities to offer greater value in the service provided to customers, increasing the overall satisfaction rate. Moreover, the framework offers a strategic orientation, with the aim of leveraging the company's existing assets



Graph XXXVII: Porter's Value Chain
Source: Porter (1985)

SUPPORT ACTIVITIES

Firm Infrastructure: The firm infrastructure supports the systems and processes in place, therefore, being a vital component to ensure the company's operations are enhanced. By being part of INCM, Contrastaria possesses its own internal structure while also sharing activities with the parent company, such as accounting and legal functions. The internal structure is divided into 6 departments, namely: Management, Customer Service, Hallmarking, Laboratory, Inspection and Innovation

Human Resource Management: INCM follows best practices when it comes to human resources management, namely, in the activities involved in recruiting, hiring, training, developing, compensating and dismissing personnel. The company promotes the growth of its employees, offering favourable working conditions and fostering their well-being through initiatives that ensure the realisation of INCM's corporate goals. Therefore, there's an ongoing investment in recruitment and selection of personnel, performance evaluation, salary processing and social support, for a balanced conciliation between personal and professional responsibilities. INCM aims to provide the right environment for personal development and allow employees to reach their full potential. Such practices are reflected in the work atmosphere, defined by the presence of trust and fellowship

Technology Development: Revitalisation of the company's activities is an active goal for INCM. Contrastaria has been focusing its efforts in innovating its current processes and services as an attempt to offer greater value to customers as well as end-consumers. The UniqueMark is one example of a project being pursued currently in partnership with the university of Coimbra with the goal of increasing the traceability of jewellery

Procurement: Contrastaria's activities involve a low degree of materials, and these entail a long lifespan, not requiring constant replacement. The resources considered in the company's activities are the punch, the substances used in the laboratory and reams of paper. For that reason, procurement is not considered a vital activity for the company since Contrastaria is a service provider with relatively low variable costs

Source: Client's Internal Data, Porter (1985)

Contrastaria's primary activities focus on the logistics and operations behind the main services the firm provides, namely assaying and hallmarking precious metal before these are sold to end-consumers by the Economic Operators

C.3.2. Analysis I Internal I Porter's Value Chain Model (II/II)

PRIMARY ACTIVITIES

Inbound Logistics: Contrastaria mostly receives the products to be assayed in person, personally delivered by the Economic Operator or a representative at one of the 3 Assay Offices in Portugal: Lisbon, Gondomar and Porto. Contrastaria also offers a transportation service that securely collects the items at the Economic Operator's preferred location

Operations: After receiving the precious metal artefacts, these move to the laboratory, where a series of tests are conducted, with the aim of analysing the purity of the metal. After the item has been assayed it moves to the hallmarking section, where the hallmark technique is selected according to the purity tested previously. The item is then moved to the vault, where it will stay until it is collected. The lead time of Contrastaria's service is dependent on the urgency rate selected by the Economic Operator, which can be regular, urgent, very urgent or express. Nevertheless, the average lead time is 2.4 days

Outbound Logistics: After the service demanded by the customer is completed, the Economic Operator or a representative collects the hallmarked items. The secure transportation service is also an option after the items have been hallmarked and, in this case, they are delivered directly to the Economic Operator

Marketing and Sales: In consequence of the mandatory hallmarking system present in Portugal and because Contrastaria represents a monopoly in the Jewellery and Watch Sector, large efforts in Marketing and Sales are not necessary to gain clients. The Marketing strategy in place consists mainly of a weekly Newsletter, that offers updates about Contrastaria's operations. Also, there are no Marketing efforts targeting the end-consumer. In terms of Sales, Contrastaria, when necessary, contacts directly with the Economic Operator it believes would be a beneficial client

Services: The services offered by Contrastaria consist in official and unofficial services. The official services include assaying and hallmarking precious metal items, while the unofficial services include training offers, hallmarking at the Economic Operators' site and transportation services, which collects and delivers the Economic Operators' artefacts. Apart from the mentioned activities, Contrastaria is the entity that provides an activity certificate, necessary for Economic Operators to enter the Jewellery and Watch Sector. The activity can be industrial goldsmith, artist, jewellery retailer, jewellery wholesaler, lender, melter-assayer or retailer for the purchase and sale of used articles of precious metals

KEY TAKEAWAYS

- Contrastaria presents a well organised structure which offers the support required for the primary activities to operate in an efficient manner and to maintain constant improvement levels
- Marketing and Sales present space for improvement since these functions can be leveraged to gain a closer contact with the direct and indirect clients (i.e. retailers) while there is also an opportunity to increase Contrastaria's visibility amongst the Portuguese population
- An opportunity to include new, more competitive services also emerges, creating the possibility of new revenue streams to be incorporated along with existing ones. Unofficial services with potential of being offered by Contrastaria include consulting services, training, valuation services, laboratory testing for different industries and diamond analysis services

Source: Client's Internal Data, Porter (1985)

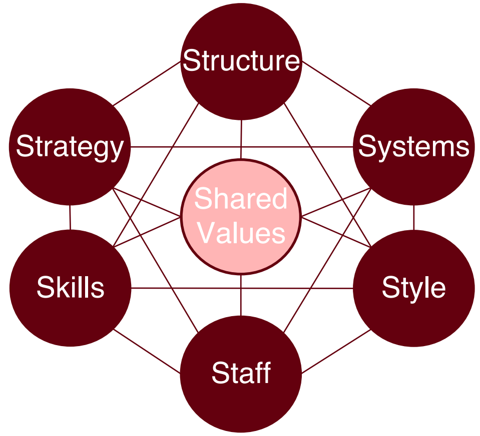
The McKinsey 7S framework is subdivided between "Soft" and "Hard" elements, evaluating the interconnectedness of the seven areas analysed. Through the Hard S' analysis, Contrastaria's structure, strategy and systems were verified

CONTRASTARIA

C.3.3. Analysis I Internal I McKinsey 7S Model (I/II)

MCKINSEY 7S

- The **McKinsey 7S Framework** was built throughout the 1980s by the company's consultants and is widely used in academic environments, being one of the most prestigious and popular strategic planning tools
- The main emphasis of this framework is on human resources (Soft S), instead of the traditional mass production of capital, equipment and infrastructure, critical for top firms' organizational structure. The model's objective is to express how the 7 elements: **Structure, Strategy, Systems, Skills, Style, Staff, and Shared Values,** can be aligned in order to achieve a high degree of effectiveness within the institution
- Therefore, the main argument is that **all the 7 elements are interconnected**, implying that **a change in one specific area will put in cause the other 6**
- In this model, the elements are divided into ***"Soft"*** and ***"Hard"*** areas. Hard elements, normally are extremely easier to change and manage when compared to Soft, which are aligned with the institution's foundation and are **most likely the basis for the creation of competitive advantages**



Info graph XXXVIII: McKinsey 7S Framework Structure
Source: Strategic Management Insight

HARD S' ANALYSIS

- **Structure:** Analysis the way business divisions and units are organized, representing the structure in the organization chart of the firm. The structure is one of the easiest elements of the framework for a possible change. Regarding Contrastaria, **this business unit belongs to INCM**, a Portuguese governmental institution. However, even though it operates within INCM, **Contrastaria is an autonomous business unit,** being responsible for all the decisions taken, with exception of Channels and Marketing Department, activities that are carried out by the organizational support unit of INCM
- **Strategy:** Consists in the plan followed by a firm to achieve sustained competitive advantage, to be a successful competitor in the market, which is reinforced by a strong vision, mission and values. The **credibility and know-how intrinsic to Contrastaria shall adapt those strengths to better serve the industry** and all the stakeholders surrounding it, mainly the Economic Operators and end-customers, establishing a crucial intermediate relationship between those, **offering strategic and efficient services** connected with the development of credibility and awareness of the hallmarking system. Therefore, the company should look for opportunities to improve its strategy, through the introduction of innovative services
- **Systems:** Procedures and processes of the company, which reveal daily business decisions, analysing workflows and the whole process of decision-making within a company. Contrastaria's workflow and processes are currently well established, even though necessary **innovations** and **technological improvements** should be taken into consideration

Source: Client's Internal Data, Contrastaria (2021), Strategic Management Insights (2021)

Contrastaria's Soft S' were proven to be a basis of a potential competitive advantage, due to existence of highly skilled personnel, and cooperative and respectful atmosphere, that fosters the growth of employees

CONTRASTARIA

C.3.3. Analysis I Internal I McKinsey 7S Model (II/II)

SOFT S' ANALYSIS

- **Style:** Represents the way **the company is managed by top-tier managers**, how they interact, and what kind of actions they take. It is basically the management style of the institution's leaders. As it was mentioned before, Contrastaria is **an autonomous business unit**. Therefore, all of Contrastaria's business decisions are undertaken by an administrative board which is responsible for managing its daily activities, having a traditional and hierarchical culture. The Portuguese Assay Office's leadership can be characterized as a **transformational leadership**, as the new management has made some strong changes in the business, focusing on innovation and incentive efforts. There is also charisma and motivation intrinsic to Contrastaria's leadership, with a set of challenging goals performed by a united and inspired team
- **Skills:** The **main abilities that firms' employees possess which enable them to perform in an efficient manner**, namely their capabilities and competences. During a transformational process, one of the biggest questions that normally arises is which kind of skills and abilities will employees need to gain and reinforce to adopt a company's new strategy. Contrastaria is continuously **hiring highly skilled people, maintaining minimum qualification requirements** in specific areas of its activity like the laboratory and company management. In the punching section, although a high degree of qualifications is not required, workers need to gain extensive experience through training
- **Staff:** This element corresponds to the **talent management** inside the firm. It is concerned with the type and the number of employees an organization must have to successfully manage its operations, and how they will be recruited, trained, motivated and rewarded. Contrastaria prioritizes its **employees and fosters their professional growth**, investing in mandatory and optional training, in order to be constantly aligned with the sector's needs
- **Shared Values:** Are at the core of the McKinsey 7S model. They **represents the alignment of all the elements analysed**, which are highlighted by the **mission, values and strategic goals**. Contrastaria has a very strong mission and core values: Ensure the **safety** of the end-consumer and develop **trust** within the Jewellery and Watch Sector trough the development of a **credible** hallmarking system, promoting the combination within **tradition** and **innovation**

Even though Contrastaria is one of INCM's business units, the company possesses great autonomy, having a **separate management system which is responsible for taking active daily decisions and delineating Contrastaria's strategic path.** This firm has a central position in the industry, since its activity affects all Economic Operators integrating the Jewellery and Watch Sector as well as the end-customer, ensuring **safety, trust and credibility, supported by tradition and innovation**. In order to guarantee those crucial elements, it's indispensable to have a highly skilled and experienced team, and top-management leaders with strategic and flexible capabilities to adapt to this constantly changing business environment

Source: Client's Internal Data, Contrastaria (2021), Iberdrola (2021), Strategic Management Insights (2021)

Contrastaria should leverage its Strengths and take advantage of emerging Opportunities within the industry in order to diminish Threats and overcome its Weaknesses, maximizing the value offered to customers and end-consumers

C.3.4. Analysis I Internal I SWOT and TOWS (I/II)

SWOT ANALYSIS

The SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis is a fact-based strategic management technique that **evaluates a company's current competitive position**. The framework assesses the **internal and external environment**, offering crucial insights to define a company's future strategic orientations

STRENGTHS

S1. Know-how: the Assay Office business in Portugal has been handed over to the Casa da Moeda since 1882

S2. Exclusivity: only INCM is authorized to carry out this activity in the country

S3. Credibility: By being the only institution in Portugal and Assay Office responsible for the Hallmarking System, Contrastaria is seen as highly reliable and credible

S4. Work Force: Contrastaria presents a highly family-like environment, where ambition for improvement and skills development are notable

WEAKNESSES

W1. State Business Sector (SEE): the activities carried out by INCM are covered by the measures defined for companies from the SEE, stipulated in the State Budget Law, which guides its performance in different areas

W2. Shared value and approaching the customer: INCM faces the challenge of developing a value chain that brings its customers and the industry players closer

W3. Lack of complementary services: One of the aspects to be improved by Contrastaria is the range of additional services offered, which has space to be widened

W4. Lack of innovation: Even though innovation has been a priority, the company is still behind international standards

OPPORTUNITIES

O1. Increasing digitalization: Towards the development of new technologies

O2. Development of consulting services: Implementation of follow-up plans and strategic analysis for the Assay Office's clients

O3. Incrementation of digital processes: Considering the developments of other Assay Offices, the introduction of new technologies is seen as an opportunity to decrease the lead time associated to Contrastaria's internal process

O4. Implementation of a continuous logistics system

O5. Sustainability Potential: Fast-moving transformation towards sustainability

O6. High exportation acceptance: Portugal is increasing the exportation of goods

THREATS

T1. Stamps/Tags: The development of new, more efficient processes is an extreme threat to the Portuguese Contrasting Industry, leading to the possible loss of customers

T2. Dependence on large clients: Large clients present a high bargaining power and can have a significant impact on Contrastaria's financial results

T3. Dependence on the economic sector: The Assay Office is always dependent on the macroeconomic environment affecting the sector's performance

T4. Lack of knowledge about the end-consumer: Driven by the low contact with the industry, consumers present lack of knowledge regarding their buyer's rights

T5. Unofficial Services: International Assay Offices are introducing new, innovative unofficial services to attract new customers

Source: Client's Internal Data, SWOT Framework Humphrey (1960), Team Based

Contrastaria should leverage its Strengths and take advantage of emerging Opportunities within the industry in order to diminish Threats and overcome its Weaknesses, maximizing the value offered to customers and end-consumers

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C.3.4 Analysis I Internal I SWOT and TOWS (II/II)

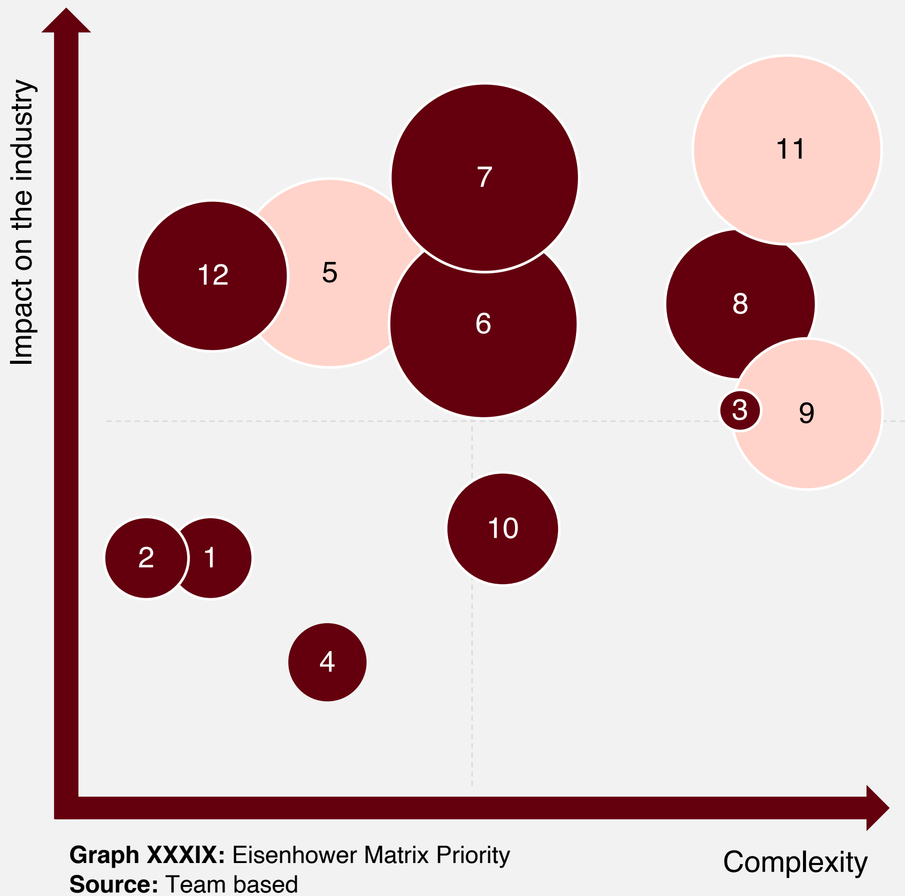
		STRENGTHS	WEAKNESSES
		S1: Know-how **S2:** Exclusivity **S3:** Credibility **S4:** Work Force	**W1:** State Business Sector (SEE) **W2:** Shared Value and Approaching the Customer **W3:** Lack of supply of complementary services **W4:** Lack of innovation
THREATS	**T1:** Stamps/Tags **T2:** Dependence on Large Clients **T3:** Dependence on the Economic Sector **T4:** Lack of knowledge about the end-consumer **T5:** Unofficial Services	(S1, S3 I T5) Contrastaria's know-how and market credibility allow the firm to further create and develop a wide range of unofficial services, leveraging their services portfolio and established relationship with Economic Operators (S1, S2, S4 I T4) The lack of knowledge regarding the end-consumer might stand as a challenge to the institution in the fulfilment of its mission. Therefore, Contrastaria should leverage its know-how, credibility and ambitious workforce, to examine the consumers' perceptions and needs. This approach will allow the company to optimise its current offerings and needs accordingly	(T2, T3 I W1) The dependence on large clients and on the macroeconomic environment that affects the sector's performance, alongside the restrictions arising from being a SEE (budget and operations restrictions), can affect Contrastaria's competitiveness and be extremely dangerous for the its future development (T1, T4, T5 I W2, W3, W4) Contrastaria's lack of proper innovation regarding its processes and service offerings, alongside the lack of knowledge regarding the consumer's perceptions on the industry, might put the firm in an instable position as competitors are investing and developing both official and unofficial services
OPPORTUNITIES	**O1:** Increasing Digitalization **O2:** Development of Consulting Services **O3:** Incrementation of digital processes **O4:** Implementation of a continuous logistics plan **O5:** Sustainability Potential **O6:** High exportation acceptance	(S1, S3 I O1, O3, O4) Contrastaria's internal resources, such as the industry's know-how and the resilient and motivated work force, stand as the main drivers for internal improvements, through the digitalization of internal processes and logistic systems (S1, S2, S3, S4 I O5) Contrastaria's credibility in the sector can be leveraged in order to fuel the industry's transformation regarding sustainable practices, acting as a role model for Economic Operators and industry stakeholders	(O1, O2, O3, O4 I W2, W3, W4) The increasing digitalization phenomenon, the development of consulting services and the implementation of a continuous logistic plan will help Contrastaria to diminish the lack of innovation and widen its service offerings, enhancing the relationship with sector's players and improving the company's overall internal performance (O5, O6 I W1) Even though Contrastaria is an SEE with defined budgets and restricted operations, it has the power and market credibility to increase exports and sustainability measures across the sector. Thus, developing the industry and enhancing their international recognition

Source: TOWS Framework Humphrey (1960)

After analysing the impact in shared value and on the industry as well as the complexity of each hypothesis, hypotheses 5,9 and 11 were selected to be pursued further

CONTRASTARIA

D.1. Hypothesis Testing I Priority Matrix



Graph XXXIX: Eisenhower Matrix Priority
Source: Team based

To prioritize the identified hypotheses and to reach the project's end goal, a team-based analysis of the impact on the industry, impact in shared value (size of the circle) and overall complexity of each initiative were evaluated

Hypothesis to be validated:

1. Should Contrastaria use physical selling points to distribute informative instruments to consumers such as **flyers**?
2. Should Contrastaria use physical selling points to distribute informative instruments to consumers such as **cards**?
3. Should Contrastaria use physical selling points to distribute informative instruments to consumers such as **tags**?
4. Should Contrastaria use **newspapers** to create awareness amongst consumers?
5. Should Contrastaria leverage the reach of digital advertising to create awareness amongst consumers through **Social Media**?
6. Should Contrastaria leverage the reach of digital advertising to create awareness amongst consumers through **TV reports**?
7. Should Contrastaria leverage the reach of TV and online advertising to create awareness amongst consumers through **TV commercials**?
8. Should Contrastaria create awareness amongst online consumers by standardizing the reference to Contrastaria's certification on **retailers' websites**?
9. Should Contrastaria **decrease the use of paper** in their internal operations by implementing the usage of dashboards through tablets and TV screens to aid their internal processes?
10. Should Contrastaria implement a **chatbot** in its website in order to chat with customers in real time?
11. Should Contrastaria create a **digital certificate** to protect online buyers from counterfeits and foster loyal competition among Economic Operators?
12. Should Contrastaria offer easy and accessible forms of **gathering feedback** to enable continuous service improvement and tighten the relationship with clients?

Based on the criteria considered, the hypothesis that will be tested are: **5, 9 and 11**

Source: Team based

Portuguese consumers are increasingly open to online purchases while the parallel market has been growing, proving the existing need for the development of a digital certification that will protect consumers

CONTRASTARIA

D.2.1. Hypothesis Testing I Digitalization Strategy I Hypothesis I: *Should Contrastaria create a digital certificate to protect online buyers from counterfeits and foster loyal competition among Economic Operators?* (I/II)

Online Market

- The pandemic accelerated digitalization and **increased the receptiveness of consumers towards the online market**
- In the Portuguese market, the **weight of the online market on the industry's revenues** is expected to **grow consistently** over the near future, representing **46.3% of revenues in 2025**

Counterfeits

- The **parallel market has been growing** and the imitation jewellery presented a **trade value of $6.6B in 2019**, even though most countries have tight regulations with the aim of protecting the consumer
- In 2019, the British Hallmarking Council released data which demonstrated that **24% of gold jewellery listings** on online marketplaces **were suspected to be fake**, amounting to a **total value of £1.4 million**
- Pandorapick.com, a website that closely resembled Pandora's official website, sold cheap imitations imported from China, **fooling consumers who thought they were purchasing legitimate jewellery**

Digital Certification

- A digital certification consists in a **guarantee that an identity is complying with pre-defined requirements**
- The development of the Digital Certificate provides consumers with **a safer purchasing act and intensifies the sector's reliability**, promoting trust and ensuring the protection of consumers

Digital Certification Advantages

"The big problem with buying online is the risk that the item may not have the expected characteristics which you can hardly see from the images displayed during the online shopping act. If Contrastaria could guarantee that the piece and the information were trustworthy and there was someone to take responsibility in case a problem came up, I would buy online." (Female, 40 years old)

"I would buy online if I could be given a full guarantee of the authenticity and value of what I am buying." (Male, 50 years old)

Advantages for Retailers:

1. **Establishing a relationship based on trust** with the consumer
2. Improve conversion
3. Build a **quality brand image**
4. **Greater brand exposure**
5. Website content support

Advantages for Consumers:

1. **Greater security and trust** in the online purchasing process
2. **Easier to find reliable retailers**
3. Protects sensitive information **against counterfeit alternatives**

KEY TAKEAWAYS

- The Portuguese **online Jewellery and Watch Market is expected to grow** in the near future
- Nevertheless, the **parallel market** is expected to **follow the same tendency**
- Therefore, it is **crucial to implement measures** that will **protect online consumers**
- The use of a digital certification **will work towards that exact goal, offering consumers greater security during their online purchases**

Source: Assay Assured (2021), CNBC (2017), GlobalSign (2018), Interviews, OEC (2020), Statista (2021), The Goldsmiths' Company (2019)

Data shows the success in the digital certification scheme created by Edinburgh's Assay Office, with 70% of buyers looking for the certification before purchasing a piece of jewellery made with precious metals on the internet

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D.2.1. Hypothesis Testing I Digitalization Strategy I Hypothesis I: *Should Contrastaria create a digital certificate to protect online buyers from counterfeits and foster loyal competition among Economic Operators?* (II/II)

Assay Assured

- Digital certification created by Edinburgh's Assay Office in 2012, that allows legitimate retailers to promote their good practices within the industry, protecting online consumers against counterfeits

Scott Walter, CEO of Edinburgh Assay Office explains:

"UK Hallmarks have provided consumer protection for hundreds of years by guaranteeing the precious metal content in a piece of jewellery. Today online shoppers have no way of physically checking whether a piece of jewellery is hallmarked or not. The results of the survey show that Assay Assured is a mark that the customer trusts and provides peace of mind when making a purchase. Our survey results clearly demonstrate the importance of giving a jewellery specific trust mark scheme front of stage on your website."

Sam Shanks, Marketing Executive of QP Jewellers even mentioned:

"We take pride in the integrity and quality of our collection. To convey this to our customers we participate in the Assay Assured scheme. Since we began displaying the Assay Assured trust mark we have experienced a marked increase in the number of orders we receive each day. This clearly demonstrates that consumers really do appreciate the peace of mind this scheme brings."

Edinburgh Assay Office Survey results regarding Assay Assured

90% **of shoppers** consider as '**very important**' knowing that their online jewellery purchase **is genuine and transparent**

70% **of consumers** will search for a trust scheme on the site before completing any kind of purchase

70% of consumers surveyed stated that they are more likely to buy **from a website displaying the accreditation**

84% of the people surveyed said that they were **more likely to trust the Assay Assured trust mark as it is a jewellery specific scheme** supported by an independent expert arbitration service

Costs Related with the Creation of a Digital Certificate

25€ Website Domain & Host × 12 Months + 500€ Website builder + 300€ Digital Logo Creation = 1,100€ First year

After the first year, the cost will decrease to the monthly payment regarding the website domain and host, which will be around 300€ per month

KEY TAKEAWAYS

- The creation of Assay Assured by Edinburgh's Assay Office was extremely relevant for the establishment of a **safe environment**, since 84% of respondents stated they were more likely to **trust the Assay Assured Certification**
- The implementation of this strategy **highly impacted daily purchases**

Thus, Contrastaria should offer a digital certificate to foster loyal competition and protect consumers' rights

Source: Assay Assured (2021), Edinburgh Assay Office (2021), Fortinet (2019), GlobalSign (2021), WordPress.com (2019)

Although the energy of the digital application is much higher, by removing the paper guides, it is possible to reduce to one tenth the amount of CO_2 expelled into the air and accelerate the digital transformation of Contrastaria

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D.2.2.Hypothesis Testing I Digitalization Strategy I Hypothesis II: *Should Contrastaria decrease the use of paper in their internal operations by implementing dashboards through tablets and TV screens?* (I/II)

Digitalization of Internal Processes

- **The Digitalization of internal processes** relies on converting information to a digital (computerized) format
- The business transformation process is a **fundamental aspect for the continuity of the activity**
- Digitalization allows for increased efficiency, consistency and quality of processes

Benefits of digitizing internal processes:

1. **Increased efficiency and productivity:** reduces manual effort when it comes to repetitive processes, making them less error-prone, freeing up resources for tasks where creativity is needed and machines cannot intervene
2. **Grouping of records and files in a digitized way**, eliminating redundancies and reducing the communication chain
3. **Improved information exchange and reduced costs**
4. **Safer data storage** in digital format

77% of companies say the relationship with digital transformation is generally average or above average

40% of executives report that the main benefit of the digital transformation is operational efficiency

Paper vs Digital Environmental Cost Estimation

Impacts on the Ecological Footprint of the use of Paper Guides in the Assay Office's internal process

20,800 corresponds to the number of sheets used, on average, per year, by the Assay Office in printing the Guides

1,100 Kg of CO_2 emitted into the air when using paper, ink cartridges and printing

2,854 Watts required to carry out the activity in all processes

Impacts on the Ecological Footprint of the use of Dashboards and Tablets in the same internal process

137 Kg of CO_2 emitted into the air when using these digital forms

476,280 Watts required to carry out the activity of the processes

- As it is possible to visualize in the values presented, the digitalization and automation of processes offers a **considerable environmental cost reduction,** while boosting operation's efficiency and data safety

KEY TAKEAWAYS

- **Digitalizing internal processes** will allow a safer and more organized storage of information, while increasing processes' efficiency
- Combining the paper used, the ink cartridges and the printing time of the printer, it is possible to note that **1100Kg of CO_2 is emitted into the air** every year
- By adapting this process to a digital form, it is possible **to reduce emissions to a tenth,** thus reducing Contrastaria's carbon footprint

The calculations presented do not consider the following aspects due to lack of complete information:
Impact of energy production; Landfill impact; Impact of dashboard production

Source: Ezeep (2021), FujiFilm (2021), Water Print Network (2021)

The development of digital process through the positioning of Dashboards and Tablets instead of paper guides, with a life span of 5 years, will save at least 40% on costs to the Portuguese Assay Office, Contrastaria

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D.2.2.Hypothesis Testing I Digitalization Strategy I Hypothesis II: *Should Contrastaria decrease the use of paper in their internal operations by implementing dashboards through tablets and TV screens?* (II/II)

Financial Cost Structure Estimation

The **following assumptions** were made in developing the costs between the use of paper and the introduction of Dashboards as a process to replace paper:

- The average number of clients per **2 weeks** in Lisbon, Porto and Gondomar, are **192.5, 393 and 857.5**, respectively
- The average number of guides per week in Lisbon, Porto and Gondomar, are **85, 115 and 200**, respectively
- The total number of sheets used by the Assay Offices was considered to be **20800.** Being a ream of 500 sheets, this corresponds to **42 reams**
- The value of 3.49€ was considered given the sample presented on the market, as well as the value of the ink cartridges, leading to the value of **25.49€**
- **3 TV screens** were considered for each Assay Office (9 in total)
- The number of ink cartridges was calculated based on the average printing of **3000 sheets per cartridge**
- The price of the TVs was considered to be **175€,** given the market offer of models with 32 inches
- Software cost evaluated through the Project Manager Website was **22€/month**

Paper: 42 Ream × 3,49 € per ream × 5 Years + 34 ink cartridges × 25,49 € /ink cartridge × 5 Years = 5066,2 € w/ IVA

Dashboard: 9 TV screens × 175 € por screen + 264€ Software Cost × 5 Years = 2895€ w/ IVA

Note: The estimated costs were calculated in a 5-year span due to the useful life of the dashboards

KEY TAKEAWAYS

- The estimated financial cost of using paper instead of digital processes has been proved to be **more financial costly**, besides also having a **higher environmental costly**
- On a prospect of 5 years, Contrastaria will be able **to save approximately 2 200€**, which can be allocated to other initiatives

Thus, Contrastaria should invest in digital processes, to improve efficiency, data security and decrease financial and environmental costs

Source: Ezeep (2021), FujiFilm (2021), Project Manager (2021), Water Print Network (2021)

Facebook and Instagram are the two most used social media platforms in Portugal and, therefore, are strong opportunities to increase awareness amongst young and middle-aged adults

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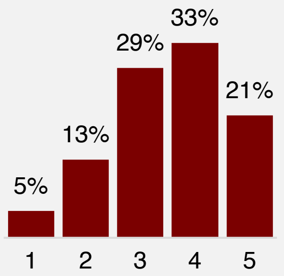
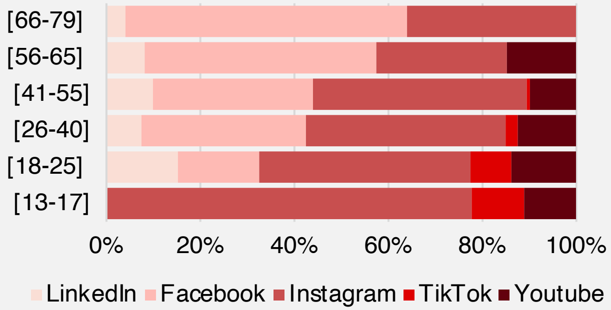
D.3.1. Hypothesis Testing I Communication Strategy I Hypothesis III: *Should Contrastaria leverage the reach of digital advertising to create awareness amongst consumers through social media?* (I/II)

Social Media Acceptance in the Promotion of the Portuguese Assay Office's Mission



Graph XXXX: Answers to: "How effective is the usage of Social Media in promoting Contrastaria's Mission?"
Source: Survey



Graph XXXXI: Answers to the question: "Which social network would you use to follow Contrastaria's activity?"
Source: Survey

- Overall, **54% of individuals confirm** the effectiveness of social networks in raising awareness
- In the young adult tier (13-25), **Instagram** represents the preferred social media platform. Between the ages of 26 and 55 years old, **Facebook** and **Instagram** show a dominant popularity
- Finally, between the ages of 56 and 79 years old, there is a greater preference for **Facebook**
- Regarding **average engagement rates**, Instagram had a 1.16% rate in 2020, while Facebook, 0.27%

Social Media Size and Relevance

Graph XXXXII: Percentage of users per Social Network
Source: Marktest

- **Facebook** experienced a **44% decrease** in the frequent users it had in 2013 compared to 2020
- In contrast, Instagram has been **growing significantly since 2017** in terms of frequent users
- TikTok has gained **greater notoriety** and popularity in Portugal

Consumers' Insights

"Newsletters would not be the best option, however, I think social networks can be a good bet." (Female, 40 years old)

"The most important thing is for Contrastaria to have an intuitive, enlightening website with the information laid out in a very tidy way. After that, an Instagram account is also important for the consumer to follow the activity." (Male, 22 years old)

KEY TAKEAWAYS

- Social Media is a **widely used network** in Portugal, with special focus on **Facebook and Instagram**
- The majority (54%) of the respondents believe that **Social Media is an effective platform to raise awareness**
- Instagram stands out as a network for **younger generations** (from 13 to 55 years old), while Facebook, besides being the platform with the highest number of users, is mostly accepted by **older generations** (above 26 years old)

Source: Interviews, Marktest (2018), Nanji (2021), Survey

A more in-depth analysis of Instagram's and Facebook's user base allows us to understand the user profiles that should mostly be targeted during the advertising campaign

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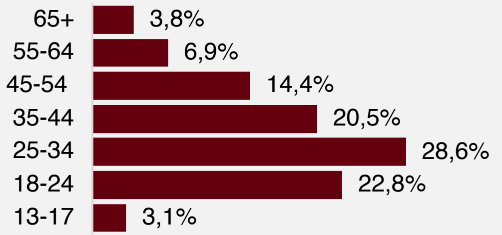
D.3.1. Hypothesis Testing I Communication Strategy I Hypothesis III: *Should Contrastaria leverage the reach of digital advertising to create awareness amongst consumers through social media?* (II/II)

Distribution of Instagram users by age group



4.79M Total users (Portugal)

55% Women (Portugal)

Graph XXXXIII: Distribution of Instagram users by age group in Portugal
Source: Statista

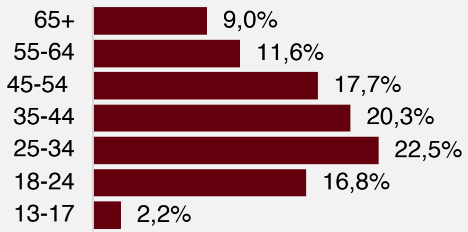
- In July 2021, there were a total **of 4.79 million users** in Portugal
- **Most** users are between **18 and 44 years old** and **55.4%** of users in Portugal are **women**
- Consists in the social media network with fastest growth

In Portugal, **75% of Instagram users** are below 45 years old, corresponding to a total of 3.6 million users. Assuming that **70% of people buy jewellery pieces** made of precious metals and of these, only **5% can be reached**, the desired reach will be **126,000 people**

€ 3.56 (CPC) × 126 000 (Audience to reach) = € 448 560

Note: The true cost of social media advertising is up to the organization, as they stipulate what budget they want to spend

Distribution of Facebook users by age group



7.92M Total users (Portugal)

52% Women (Portugal)

Graph XXXXIV: Distribution of Facebook users by age group in Portugal
Source: Statista

- In July 2021, there were a total **of 7.92 million users** in Portugal
- **Most** users are between **26 and 54 years old**, and **52.4%** of users in Portugal are **women**
- Facebook displays a more balanced distribution across the various age groups, thus being suitable for targeting a broader audience

In Portugal, **81% of Instagram users** are over 26 years old, corresponding to a total of 6.4 million users. Assuming that **70% of people buy jewellery pieces** made of precious metals and of these, only **5% can be reached**, the desired reach will be **320,000 people**

€ 0.97 (CPC) × 320 000 (Audience to reach) = € 310 400

Note: The true cost of social media advertising is up to the organization, as they stipulate what budget they want to spend

KEY TAKEAWAYS

- **More than 50%** of Instagram users are **between 18 and 35 years old,** while Facebook's audience is more **evenly** distributed in terms of age groups
- In terms of costs, Contrastaria can choose **which budget to allocate** to this type of advertising, giving a **higher degree of control** to the company

Thus, Contrastaria should create its own Facebook and Instagram accounts and allocate resources to manage them

Source: RevealBot (n.d.), Statista (2021), Survey, WebFX (n.d.)

Contrastaria should develop and launch a digital certification system, alongside a trust mark, which will protect online consumers, dynamize the industry and increase Contrastaria's visibility

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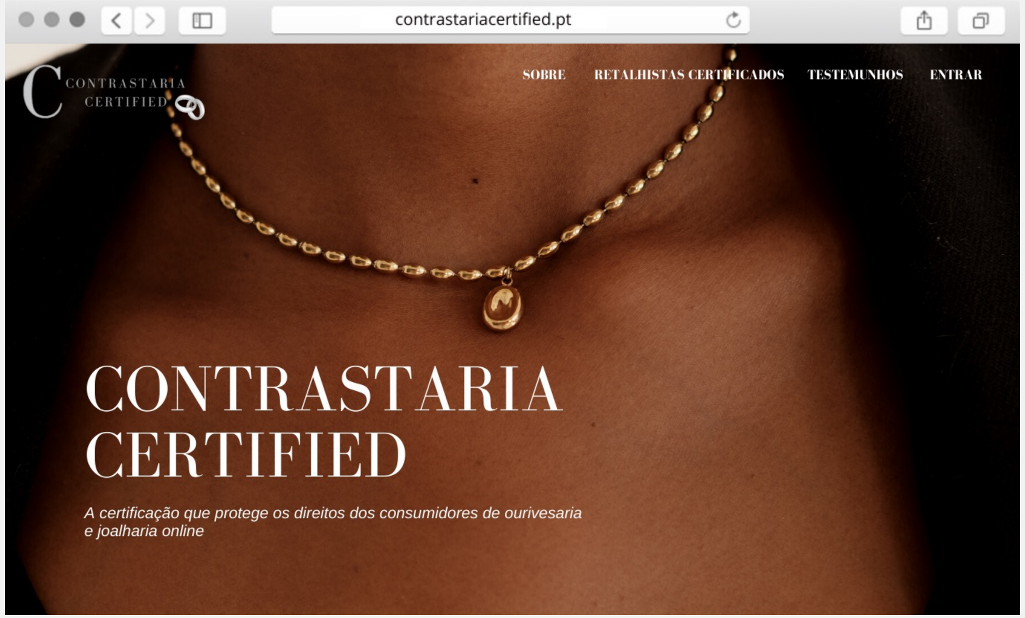
E.1. Recommendations I Digital Certification (I/II)

DIGITAL CERTIFICATION

Development of the Contrastaria Certified website and certification



CONTRASTARIA CERTIFIED

How it works

1. Retailers **sign up for the certification** and pay the **annual fee**
2. Contrastaria **audits the company** to analyse whether these are effectively **complying with the code of conduct**
3. The complying retailer **receives the trust mark** and a **certificate** issued by Contrastaria
4. Legitimate **retailers and their respective certificate are displayed on the Contrastaria Certification website**
5. Retailers **display the trust mark on their website and associate the certificate** to it
6. Consumers can **find secure retailers** on the **Contrastaria Certified website** or **look for the trust mark** on retailer's website
7. Consumers can **securely purchase their precious metal items online**
8. Retailers will then be subjected to **periodic audits** to ensure the **continuous fulfilment of the code of conduct**

DEFINITION OF SUCCESS

- High number of certified retailers
- Increase in online purchases from certified retailers' website
- High number of clicks on the Contrastaria Certified website
- Positive feedback from retailers and consumers

RISK	Lack of interest from retailers
INVESTMENT	Low
DURATION	Medium-term

Source: Team based

Contrastaria Certified will increase consumers' trust in the industry and reduce reluctance towards purchasing precious metal items online. To develop the digital certification, Contrastaria should start by creating a safe trust mark

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E.1. Recommendations I Digital Certification (II/II)

DIGITAL CERTIFICATION

Implementation Roadmap

1. Create a **secure trust mark** and **certificate** template
2. Elaborate a **code of conduct** for retailers
3. Build an **interactive and user-friendly website**. This should be very straight forward, **using visual content** (images and informative videos explaining how the certification works)
4. Use **SEO to increase traffic** within the website and ease the search process
5. **Promote the digital certification** through email marketing to Economic Operators, advertising on INCM's social media platforms, direct contact with retailers and displaying information on Contrastaria's website
6. **Take advantage of special occasions**, such as Christmas and mother's day to reinforce advertising targeting consumers
7. **Analyse results**, **keep track of KPIs** and **use feedback to implement improvements**

Creating Shared Value

Reconceiving Products and Markets	Redefining productivity in the value chain	Developing local clusters

Problem: The **low degree of personal interaction and available information** about the products **leads consumers to be easily misled when purchasing precious metal items online**, since counterfeits are often sold as legitimate items at a lower price. The lack of safety involved in online purchasing methods of precious metal items creates **resistance from citizens towards this shopping method**, being also **discouraged by professionals in the industry**

Solution: The creation of a digital certification **responds to an unmet need for online buyers' protection**. The initiative will, therefore, contribute to a **reduction of online purchases of counterfeits**, build **trust in the industry**, allow the **existing demand** for online precious metal artefacts **to be fulfilled** and **increase Contrastaria's visibility** amongst consumers

DEFINITION OF SUCCESS

- High number of certified retailers
- Increase in online purchases from certified retailers' website
- High number of clicks on the Contrastaria Certified website
- Positive feedback from retailers and consumers

RISK	Lack of interest from retailers
INVESTMENT	Low
DURATION	Medium-term

Source: Team based

Contrastaria should digitalize its internal processes through the implementation of dashboards and tablets, replacing the paper guides currently used and reducing human error associated to its operations

E.2. Recommendations I Internal Processes Digitalization (I/II)

INTERNAL PROCESSES DIGITALIZATION

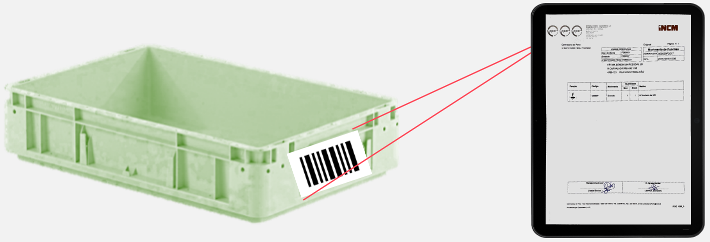
Dashboards Usage

Entry		Lab		Hallmarking		Exit	
745	566	664	664	446	556	529	391
457	698	857	496	587	514	723	
654				729	633		
				957	345		

Legend:
- Normal
- Urgent
- Very Urgent
- Express

- In order to achieve a more **digital and interactive** internal process, every Assay Office should have a TV screen in each section, displaying an **interactive and cooperative dashboard**, which would allow a more **integrated, efficient, and connected process** to be implemented
- The dashboard would be simple, as shown above, displaying the stage in which each batch on the system is, in real time. Moreover, there would be colours associated with each batch, reflecting the urgency rate (Normal, Urgent, Very Urgent, Express)

Tablets and Bar Codes' Usage



1 The process starts with the collection of the articles at the reception, which are then placed into a box similar to the one above. The first modification starts here, as the **colours of the boxes** would match the urgency rate, making it easier for employees to distinguish them

3 The next department will then collect the batches available on the previous section (which are displayed in the dashboard), scan the bar code on the box with a **tablet device** and have access to the digital guide (figure above), and the same will happen for subsequent departments

2 At the reception, the employee would register the **batch in the system**, that would automatically appear on the **dashboard** (in the entry section), and would create the **digital guide** for the batch, which will be associated to the **bar code** of the box

DEFINITION OF SUCCESS

- Improve employee performance
- Decrease lead time
- Decrease human errors
- Decrease operational and environmental costs

RISK	Adoption resistance from employees
INVESTMENT	Medium-High
DURATION	Long-Term

Source: Client's Internal Data, Team based

To introduce dashboards and tablets in Contrastaria's internal processes, the company will need to develop the software, purchase dashboards, train its employees and closely monitor the transition

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E.2. Recommendations I Internal Processes Digitalization (II/II)

INTERNAL PROCESSES DIGITALIZATION

Implementation Roadmap

1. **Develop the software** that organises the existing orders according to the degree of urgency
2. **Purchase** the necessary **assets** to implement the system (dashboards) and **set up the existing tablets**
3. Offer **training sessions** to employees on how to use the system during their daily activities, emphasizing the advantages the system provides
4. Introduce the system in **each working section and remove the paper guides**
5. **Adjustment and transition period**, with close monitoring of processes (i.e. lead time) and employees' adaption
6. Evaluate the **outcomes**, gather **feedback** from employees, create and monitor **KPIs** and implement improvements

Creating Shared Value

Reconceiving Products and Markets	**Redefining productivity in the value chain**	Developing local clusters

Problem: Contrastaria's operational processes still rely highly on **manual work**, which **leads to errors and lack of efficiency**. The sequencing of orders to address is written by the employees on a board and the paper guides, that entail all the necessary information about the batch at hand (service required, type of metal, purity) are left on the batch's box which can easily lead to the guides being mistakenly switched or lost

Solution: The investment in a **more digital oriented operating system** will **increase productivity** in Contrastaria's value chain, **decrease the amount of paper used**, **decrease human errors** associated to the assaying and hallmarking of precious metal batches and thereby **increase customer satisfaction**

DEFINITION OF SUCCESS

- Improve employee performance
- Decrease lead time
- Decrease human errors
- Decrease operational and environmental costs

RISK	Adoption resistance from employees
INVESTMENT	Medium-High
DURATION	Long-Term

Source: Team based

Contrastaria should create a social media advertising campaign with the aim of increasing awareness amongst Portuguese citizens, leveraging the reach of digital advertising

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E.3. Recommendations I Paid Social Media Advertising (I/II)

PAID SOCIAL MEDIA ADVERTISING

Instagram

Goals

- **Highlighting** your activity, your feed is your identity
- **Showcase** your services and team
- **Link with the community** by sharing your mission and values

Audience

TOTAL USERS: **+4 MILLION**

TARGET: 75% — Users below 45 years old — **3.6M**

Advice

- Choose what percentage of this 3.6M to reach and the respective budget

Tools

- PRO **Business**
- Video Editing **InShot**
- STORIES **Mojo**

facebook

Goals

- **Build** community and customer loyalty
- **Showcase** your services and team
- **Share** relevant info and content

Audience

TOTAL USERS: **+7 MILLION**

TARGET: 81% — Users over 25 years old — **6.4M**

Advice

- Choose what percentage of this 6.4M to reach and the respective budget

Tools

- PROMOTE, ANALYSE, REPORT **Meta for Business**
- Contact **Messenger**

DEFINITION OF SUCCESS

- Number of followers
- Number of likes
- Number of shares
- Number of impressions
- Average engagement rate
- Audience growth rate

RISK	Targeting the wrong segment
INVESTMENT	Low to High (Customizable)
DURATION	Short-Term

Source: Team based

The social media advertising campaign will reposition the sector, increase buyer's trust in the market and respond to their needs. The first step should be assigning a specific team responsible for each social media network

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E.3. Recommendations I Paid Social Media Advertising (II/II)

PAID SOCIAL MEDIA ADVERTISING

Implementation Roadmap

1. Compile and assign a **specific team responsible for each Social Media Platform**
2. Define **integrated communication strategies** across Contrastaria's digital platforms
3. Select **social media marketing goals** that align to **business objectives**
4. Create accounts on each social media platform to promote **Contrastaria's mission**
5. **Organise, create and project** future ad campaigns and predefine a post schedule
6. Choose a **budget** and select which action to pay for (views, clicks, shares, …)
7. Build audience using demographic, interest, and device targeting, that fits the established budget
8. Approve and launch ad, **define goals**, collect **feedback** and keep track of the **KPIs**

Creating Shared Value

Reconceiving Products and Markets	Redefining productivity in the value chain	Developing local clusters

Problem: Contrastaria is responsible for satisfying consumers' needs for **safety** regarding market transparency. However, being vastly unknown amongst citizens, **the firm cannot fully fulfil its mission**

Solution: Investing in and developing **paid Social Media advertising** will allow Contrastaria to **Create Shared Value** from the perspective of **reconceiving the market** by (1) dynamizing the sector through the **firm's repositioning** in the traditional Jewellery and Watch Industry, (2) **increase buyer's trust** in the sector and related purchases, and (3) **better meeting consumers' needs** by raising awareness regarding the firm's mission amongst the Portuguese population, as buyers will be aware of their rights and demand retailers to match them

DEFINITION OF SUCCESS

- Number of followers
- Number of likes
- Number of shares
- Number of impressions
- Average engagement rate
- Audience growth rate

RISK	Targeting the wrong segment
INVESTMENT	Low to High (Customizable)
DURATION	Short-Term

Source: Team based

The social media advertising campaign and internal processes digitalization project should be initiated simultaneously during the first semester, while Contrastaria Certified should be developed from the third semester onwards

E.4. Recommendations I Implementation Roadmap

Recommendation	Semesters							
	1	2	3	4	5	6	7	>7
1. Digital Certification		Website & logo development	Implement digital certification Promote the digital certification					
2. Internal Processes Digitalization	Software development	Training sections and last improvements	Introduction of the digital operating system					
3. Paid Social Media Advertising	Social media plan creation & preparation	Paid advertising campaign	Regular posts on each social media platform					

Both the **internal processes digitalization** and **paid social media advertising** projects should be initiated during the first semester of 2022. In the case of the internal processes, the software development is expected to have a total duration of six months, while the second semester of 2022 should be dedicated to training sessions before the full introduction of the digital operating system. The paid social media advertising project will have a similar roadmap, starting off with the content creation and calendar planning, before initiating the paid advertising campaign which will last for 6 months, coinciding with Christmas, an occasion where there's a peak in demand for jewellery and watches. The advertising campaign will enable a significant traffic in Contrastaria's social media accounts, after which the company should focus on posting regularly, adapting the content to the target audience. The development of the digital certification should only be initiated in the second semester of 2022 and the launch of the certification as well as its promotion during the third semester, taking advantage of the social media campaign's impact (increase in awareness and consequent need for the certification)

Source: Team based

Throughout the development of the project, the Team faced several challenges, such as time constraints, lack of available data, and survey biases, which were all overcome with success

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F. Risks, Limitations & Further Research

RISKS, LIMITATIONS AND FURTHER RESEARCH

Wide Scope of Action: As the first ever project between Nova SBE and Impresa Casa Nacional da Moeda (Contrastaria), there was no past experience with the Client nor expectations regarding the scope of the project

Industry Knowledge: The underline industry of the project, the Jewellery and Watch Sector, and the Assay Office division in specific, are very technical industries with specific terms, knowledge and know-how, which made it time-consuming and challenging for the Team to grasp it at first

Available Data: There was minimal information available regarding the Jewellery and Watch Industry, and in particular, data on Assay Offices. Almost every report on the subject was paid, while almost every person we tried to reach (without the help of the Portuguese Assay Office), such as International Assay Offices, often did not reply or were unavailable to offer help to the Team

Time Constraints: The time available (almost four months) for the development of this complex and vast thesis was not enough. Even though the final recommendations left the Client extremely satisfied, with a great sense of value-added, the Team believes that it would have been possible to overdeliver or focus even more on some aspects if only there was more time available

Social Desirability Bias: The most important survey that the Team created, regarding the population's awareness regarding the Portuguese Assay Office and Hallmarking, tested the knowledge of the inquiries on some levels such as "Do you know what Hallmarks are?" or "Do you know who is responsible for hallmarking the precious metals pieces?". Therefore, there might have been *Social Desirability Bias* in some answers. Social desirability is then the tendency of answering in a way that seems to be more socially acceptable than the "true" answer. Respondents often do this to project a favourable image of themselves, while trying to avoid receiving negative evaluations from others. The outcome, however, is the overreport of socially desirable attitudes and, on the other side, the underreport of socially undesirable behaviours

To minimize this bias, the Team tried to implement and assure complete anonymity. This way, if a respondent knows his answers and personal data won't be disclosed, he/she will be more likely to answer truthfully

Further Research: The Team could have invested in further research regarding how the internal process digitalization will affect the lead time and efficiency of the company's operations, the systems required for its implementation, and the processes and resources available at Contrastaria that could be leveraged. Furthermore, the analysis of the environmental impact of the paper and digital method should be further deepened through the use of a sophisticated software (e.g.: SimaPro), that would allow the thorough breakdown of the environmental cost of each stage of the life-cycle of the products

Source: Encyclopedia of Survey Research Methods (2008), Team based

References

CONTRASTARIA

G. References (I/VIII)

- AGEAS. (n.d.). Informação Institucional. Ageas Seguros. Retrieved December 14, 2021, from https://www.ageas.pt/particulares/sobre-a-ageas-seguros/informacao-institucional/#grupoageasportugal
- AGEAS. (n.d.). Os nossos desafios. Grupo AGEAS Portugal. Retrieved December 14, 2021, from https://www.grupoageas.pt/sustentabilidade/os-nossos-desafios
- AGEAS. (n.d.). Pilar Age - Responsabilidade Social. Grupo Ageas Portugal. Retrieved December 14, 2021, from https://www.grupoageas.pt/sustentabilidade/os-nossos-desafios/pilar-age
- AORP. (2021). AORP. Retrieved December 3, 2021, from https://www.aorp.pt
- AORP. (n.d.). AORP. Retrieved December 4, 2021, from https://www.aorp.pt/aorp
- ASSAY ASSURED | Search Retailer - Search for Assay Assured Jewellery Retailer | Search Assay Assured Jewellery Shops | Buy Assay Assured Jewellery Online. (n.d.). Assay Assured. Retrieved December 6, 2021, from https://www.assayassured.co.uk/website/searchretailer
- Assay Office London. (n.d.). Consumer Watch: One third of “gold” jewellery sold online could be fake. Assay Office London. Retrieved December 9, 2021, from https://www.assayofficelondon.co.uk/news/consumer-watch-one-third-of-gold-jewellery-sold-online-could-be-fake
- Bedik, A. (2021). Why Antique Jewellery is Better for the Environment. Gatsby Jewellery. Retrieved December 4, 2021, from https://www.gatsbyjewellery.co.uk/blog/why-antique-jewellery-is-better-for-the-environment
- Birmingham Assay Office. (2021) Assay Office - Hallmarking of precious metals, Gold hallmarks, Silver hallmarks - Assay Office. Birmingham Assay Office. Retrieved November 18, 2021, from https://theassayoffice.com
- Cámara Laboratorios Metrología. (2021). Contraste de Metales Preciosos. Retrieved October 24, 2021, from https://camaralaboratorios.com/servicios/laboratorio-metales-preciosos/contraste-metales- preciosos/
- Caya. (2021). Smartwatch vs Swiss watch: the decline of traditional watches. SlideBean. Retrieved November 12, 2021, from https://slidebean.com/story/swiss-watches-vs-smartwatches-who-will-survive
- Cernansky, R. (2021). Jewellery’s sustainable future: Recycled gold. Vogue Business. Retrieved December 4, 2021, from https://www.voguebusiness.com/sustainability/jewellerys-sustainable-future-recycled-gold
- Chandaria, J., Hunter, J., & Williams, A. (2011). The carbon footprint of watching television, comparing digital terrestrial television with video-on-demand. ResearchGate. Retrieved November 21, 2021, https://www.researchgate.net/publication/241184771_The_carbon_footprint_of_watching_television_comparing_digital_terrestrial_television_with_video-on-demand

References

CONTRASTARIA

G. References (II/VIII)

- Company of Goldsmith of Dublin Assay Office. (2021). Company of Goldsmith of Dublin Assay Office. The Company of Goldsmiths of Dublin The Assay Office. Retrieved November 24, 2021, from https://www.assay.ie
- Consumo Responde. (2019). El contraste de los objetos fabricados con metales preciosos y la. Consumo Responde.Retrieved November 8, 2021, from https://www.consumoresponde.es/art%C3%ADculos/contraste-objetos- fabricados-con-metales-preciosos-identificacion-origen
- Contrastaria. (2021). Missão da Contrastaria - INCM. Contrastaria Portuguesa | A Marca que faz a Diferença. Retrieved December 8, 2021, from https://www.contrastaria.pt/institucional/missao/
- Contrastaria. (2021). Página Inicial. Contrastaria Portuguesa | A Marca que faz a Diferença. Retrieved September 14, 2021, from https://www.contrastaria.pt
- Contributor, P. (2020). What is STEEP Analysis and 5 Steps to Conduct One. PESTLE Analysis. Retrieved December 10, 2021, from https://pestleanalysis.com/what-is-steep-analysis/
- COOKSON-CLAL. (2021). Fournisseur en Outillage et Matériel de Bijouterie | Cookson CLAL. Retrieved November 3, 2021, from https://www.cookson-clal.com
- COOKSON-CLAL. (2021). Le Laboratoire d'analyse Cookson-CLAL. Cookson-CLAL. Retrieved November 18, 2021, from https://www.cookson-clal.com/laboratoire
- Corporate Finance Institute. (2021). Engagement Rate. Retrieved December 12, 2021, from https://corporatefinanceinstitute.com/resources/knowledge/ecommerce-saas/engagement-rate/
- D.N. (2021). A pandemia e os trágicos números da economia portuguesa. Retrieved September 21, 2021, from DN. https://www.dn.pt/sociedade/a-pandemia-e-os-tragicos-numeros-da-economia-nacional-13480491.html
- Deloitte. (2012). Sector da Contrastaria em Portugal - Enquadramento e Apresentação. App Parlamento. Retrieved December 9, 2021, from https://app.parlamento.pt/webutils/docs/doc.pdf?path=6148523063446f764c324679626d56304c334e706447567a4c31684a5355786c5a79394454303076 4e6b4e4654314176523 15244566b38765247396a6457316c626e52766330466a64476c32615752685a47564462323170 63334e686279383359574979 4d4455354d7930324e6a6b334c5451354f4455744f 575a6c4f533077596d4d774f474a6a4d325930597a4d756347526d&fich=7ab20593-6697-4985-9fe9-0bc08bc3f4c3.pdf&Inline=true
- DGAE. (2018). Ficha de Comércio Externo - Indústrias da Joalharia, Ourivesaria e Relojoaria (Moda). Retrieved September 27, 2021, from https://www.dgae.gov.pt/gestao-de-ficheiros-externos-dgae-ano-2018/ficha-comercio-externo-industrias-da-joalharia-ourivesaria-e-relojoaria-moda-pdf.aspx
- Diário de Notícias. (2019). Setor português da joalharia espera valer 1.000 ME em 2019. Retrieved September 13, 2021, from DN. https://www.dn.pt/lusa/setor-portugues-da-joalharia-espera-valer-1000-me-em-2019--11068352.html

References

CONTRASTARIA

G. References (III/VIII)

- Eco Cost Savings. (2021). TV Wattage - 2021's Most Efficient TVs Revealed [With Data]. Eco Cost Savings. Retrieved November 21, 2021, from https://ecocostsavings.com/tv-wattage/
- ECOMEP, SLU. (2021). ECOMEP. Retrieved October 3, 2021, from http://www.ecomep.es
- eCommerceDB. (2021). The eCommerce market in Portugal. Retrieved November 21, 2021, from https://ecommercedb.com/en/markets/pt/all
- Edelmetaal Waaborg Nederland. (2020). Home. Retrieved November 29, 2021, from https://www.ewnederland.nl
- Edinburgh Assay Office. (2015). Assay Assured Survey Findings Reinforces The Need for a Jewellery Specific Trust Mark. Edinburgh Assay Office. Retrieved December 6, 2021, from https://www.edinburghassayoffice.co.uk/2015/11/30/assay-assured-survey-findings-reinforces-the-need-for-a-jewellery-specific-trust-mark-2/
- Edinburgh Assay Office. (2021). Home. Retrieved September 12, 2021, from https://www.edinburghassayoffice.co.uk
- ENAC. (2021). ENAC. Retrieved September 29, 2021, from https://www.enac.es/web/enac/quienes-somos
- Euronews. (2019). Recycled jewellery: What you need to know. Retrieved December 4, 2021, from https://www.euronews.com/green/2019/05/09/recycled-jewellery-what-you-need-to-know
- Ezeep. (2021). CO2 Neutral Printing. Retrieved November 21, 2021, from https://www.ezeep.com/co2-neutral-printing/
- Fortinet. (n.d.). What Are Digital Certificates?. Fortinet. Retrieved December 6, 2021, from https://www.fortinet.com/resources/cyberglossary/digital-certificates
- Francéclat. (2021). Francéclat. Retrieved November 21, 2021, from https://www.franceclat.fr/a-propos/
- FujiFilm (2020). Case 1: Comparison of CO2 Emissions from an Environmental Perspective Comparison of CO2 Emissions Generated When Reading Documents Prerequisites : About FUJIFILM Business Innovation : FUJIFILM Business Innovation. FujiFilm. Retrieved December 2, 2021, from https://www.fujifilm.com/fbglobal/eng/company/technology/production/ma/electronic_media/case1.html
- Fulton, A. (2020). A Warning About Buying Jewellery Online -. Alan P. Fulton. Retrieved December 9, 2021, from https://alanpfulton.com/a-warning-about-buying-jewellery-online/
- GlobalSign GMO Internet. (2020). Five Beneficial Features of Digital Certificates. GlobalSign GMO Internet, Inc. Retrieved December 5, 2021, from https://www.globalsign.com/en-sg/blog/five-beneficial-features-of-digital-certificates
- GlobalSign. (2020). Five Beneficial Features of Digital Certificates. (2020). GlobalSign. Retrieved December 14, 2021, from https://www.globalsign.com/en-sg/blog/five-beneficial-features-of-digital-certificates
- Goldsmiths' Company Assay Office. (2021). Goldsmiths' Company Assay Office in London l Goldsmiths Hallmarking. Retrieved November 6, 2021, from https://www.assayofficelondon.co.uk

References

CONTRASTARIA

G. References (IV/VIII)

- Gomes, A. (2021). A oportunidade da joalharia portuguesa. O Jornal Económico. Retrieved October 1, 2021, from https://jornaleconomico.sapo.pt/noticias/a-oportunidade-da-joalharia-portuguesa-754036
- GOV.UK. (2015). About us. Retrieved September 12, 2021, from https://www.gov.uk/government/organisations/british-hallmarking-council/about
- GOV.UK. (2021). British Hallmarking Council. Retrieved September 13, 2021, from https://www.gov.uk/government/organisations/british-hallmarking-council
- Greysheet - Coin Dealer Newsletter. (n.d.). Counterfeits Gone Viral: Online Sales of Fake Gold and Silver Cost Public Millions. CDN Publishing, LLC. Retrieved December 8, 2021, from https://www.greysheet.com/news/story/counterfeits-gone-viral-online-sales-of-fake-gold-and-silver-cost-public-millions
- Hallmarking Convention. (2021). Retrieved September 21, 2021, from Hallmarking Convention. https://hallmarkingconvention.org/en
- Ibersrola. Business leadership: which are the main styles? (n.d.). Iberdrola. Retrieved December 8, 2021, from https://www.iberdrola.com/talent/leadership-styles
- INCM. (n.d.). Imprensa Nacional-Casa da Moeda. Retrieved September 14, 2021, from https://www.incm.pt/portal/index.jsp
- Informa. (2020). Información Empresas: Ensayos Y Contraste De Metales Preciosos De Andalucia Sl. Directorio Empresas EspaÃ±a. InformaciÃ3n de Empresas, Listados de Empresas. Retrieved October 21, 2021, from https://www.informa.es/directorio-empresas/Empresa_ENSAYOS-CONTRASTE-METALES-PRECIOSOS-ANDALUCIA.html
- Investopedia. (2021). How SWOT (Strength, Weakness, Opportunity, and Threat) Analysis Works. Investopedia. Retrieved December 4, 2021, from https://www.investopedia.com/terms/s/swot.asp
- JCK Online. (2021). The Ancient Jewelry Market Has A Counterfeit Problem. JCK Online. Retrieved December 4, 2021, from https://www.jckonline.com/editorial-article/ancient-jewelry-market-counterfeit/
- Jewellers, M. (2019). What is hallmarking and why is it important? Minar Jewellers. Retrieved November 21, 2021, from https://www.minarjewellers.com/blogs/the-minar-blog/34204485-what-is-hallmarking-and-why-is-it-important
- Jewellery. (2021). World Gold Council. Retrieved November 10, 2021, from https://www.gold.org/goldhub/research/gold-demand-trends/gold-demand-trends-q3-2021/jewellery
- Jurevicius, O. (2021). McKinsey 7S Model. Strategic Management Insight. Retrieved December 8, 2021, from https://strategicmanagementinsight.com/tools/mckinsey-7s-model-framework/
- L'officiel Horlogerie Bijouterie. (2014). L'OCA Pourquery DMP. Retrieved October 28, 2021, from https://www.lofficielhb.com/metiers/loca-pourquery-dmp/
- Laboratorio . (2021). Laboratorio - FNMT. Retrieved November 2, 2021, from https://www.fnmt.es/laboratory
- Marktest. (2018). Os Portugueses e as Redes Sociais 2018. Retrieved November 1, 2021, from https://www.marktest.com/wap/private/images/Logos/Folheto_Portugueses_Redes_Sociais_2018.pdf

References

CONTRASTARIA

G. References (V/VIII)

- McKown, C. (2018). The American Greed Report: Online shopping scams: Eight signs you're on a fake site. CNBC. Retrieved December 14, 2021, from https://www.cnbc.com/2017/06/16/online-shopping-scams-how-to-identify-fake-sites.html
- McKown, C. (2018). The American Greed Report: Online shopping scams: Eight signs you're on a fake site. CNBC. Retrieved December 7, 2021, from https://www.cnbc.com/2017/06/16/online-shopping-scams-how-to-identify-fake-sites.html
- Monnaie de Paris. (2021). Monnaie de Paris Management Reports | Monnaie de Paris. Monnaie de Paris. Retrieved November 21, 2021, from https://www.monnaiedeparis.fr/en/monnaie-de-paris-management-reports
- Müller, O. R. (2021). State of the Industry – Swiss Watchmaking in 2021 | SJX Watches. SJX. Retrieved November 21, 2021, from https://watchesbysjx.com/2021/03/morgan-stanley-swiss-watch-industry-report-2021.html
- Nanji, A. (2021). Social Post Engagement Rate Benchmarks for Facebook, Instagram, Twitter. MarketingProfs. Retrieved Decemver 13, 2021, from https://www.marketingprofs.com/charts/2021/44473/social-post-engagement-benchmarks-for-facebook-instagram-and-twitter
- Nestlé. (2021). Creating Shared Value and Sustainability Report 2020. Neslté. Retrieved October 28, 2021, from https://www.nestle.com/sites/default/files/2021-03/creating-shared-value-report-2020-en.pdf
- Nestlé. About us. (n.d.). Nestlé Global. Retrieved December 14, 2021, from https://www.nestle.com/aboutus
- O'Rouke, D., & Strand, R. (2016). Patagonia: Driving Sustainable Innovation by Embracing Tensions. Berkeley-Haas Case Series.
- OEC. (2020). Imitation Jewellery (HS: 7117) Product Trade, Exporters and Importers | OEC. OEC - The Observatory of Economic Complexity. Retrieved December 8, 2021, from https://oec.world/en/profile/hs92/imitation-jewellery?yearSelector1=tradeYear1
- OEC. (n.d.). Imitation Jewellery (HS: 7117) Product Trade, Exporters and Importers | OEC. OEC - The Observatory of Economic Complexity. Retrieved December 4, 2021, from https://oec.world/en/profile/hs92/imitation-jewellery
- Online Library. (2017). Online Library. Retrieved November 21, 2021, from https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1530-9290.2010.00278.x
- Orienta-te. (n.d.) Concurso Orienta-te. Orienta-te. Retrieved December 14, 2021, from https://www.concursorientate.pt/
- Osterwalder & Pigneur (2011). Business Model Canvas. Research Gate. Retrieved December 8, 2021, from https://www.researchgate.net/figure/Business-Model-Canvas-Osterwalder-and-Pigneur-2011_fig1_339227362

References

CONTRASTARIA

G. References (VI/VIII)

- Palmer, B. (2011). Green Your Notes! Slate Magazine. Retrieved November 21, 2021, from https://slate.com/technology/2011/09/paper-versus-the-ipad-is-taking-notes-on-a-tablet-computer-or-a-notepad-more-environmentally-responsible.html
- Patagonia. (n.d.). Used Patagonia Clothing & Gear. Worn Wear. Retrieved December 14, 2021, from https://wornwear.patagonia.com/
- Patagonia. Annual Benefit Corporation Report. (2020). Patagonia. Retrieved November 21, 2021, from https://www.patagonia.com/on/demandware.static/-/Library-Sites-PatagoniaShared/default/dwf14ad70c/PDF-US/PAT_2019_BCorp_Report.pdf
- Perles & Co. (2021). Bureaux de garantie et organismes de contrôle agréés. Perles & Co. Retrieved December 2, 2021, from https://www.perlesandco.com/Bureaux-de-garantie-et-organismes-de-controles-agrees-f- 1471-9.html
- Porter, M. E. (1985). Porter's Value Chain Model. Competitive Advantage.
- Porter, M. E., & Kramer, M. R. (2011b). Creating Shared Value. Harvard Business Review.
- Porter, M. E., Kramer, M. R., Herman, K., & Cara, S. M. (2017). Nestlé's Creating Shared Value Strategy. Harvard Business School.
- Project Manager. (2021). Pricing. ProjectManager.Com. Retrieved November 14, 2021, from https://www.projectmanager.com/pricing
- Pych, J. (2017). Must Know Advertising Terms and Metrics | Bionic Advertising Systems. Bionic Advertising Systems. Retrieved December 5, 2021, from https://www.bionic-ads.com/2016/03/reach-frequency-ratings-grps-impressions-cpp-and-cpm-in-advertising/
- Revealbot. (n.d.). Facebook, Instagram & Google Ads optimization platform. Revealbot. Retrieved November 29, 2021, from https://revealbot.com/facebook-advertising-costs
- Saveco. (2021). SAVECO - S.A. de Verificación y Contraste de Metales Preciosos, S.A. Retrieved November 18, 2021, from https://www.saveco.es/texto-saveco-cordoba.php?sec=10
- Sectigo. (n.d.). Sectigo. Retrieved December 6, 2021, from https://sectigo.com/resource-library/what-is-an-ssl-certificate?utm_term=&utm_campaign=Sectigo+Retail_SSL_EMEA&utm_source=adwords&utm_medium=ppc&hsa_acc=9165095309&hsa_cam=6549903306&hsa_grp=129849826715&hsa_ad=556589830794&hsa_src=g&hsa_tgt=dsa-1454111132627&hsa_kw=&hsa_mt=&hsa_net=adwords&hsa_ver=3&gclid=Cj0KCQiAzMGNBhCyARIsANpUkzOZe1IAe3FMfMbBS334BHrKYUE3-k3xdXU8sRkTx6cNQVnC2215ToUaAuuxEALw_wcB
- Sheffield Assay Office. (2021). Hallmarking and Analytical Services. Retrieved September 18, 2021, from https://www.assayoffice.co.uk
- Shleyner, E. (2021). 19 Social Media Metrics That Really Matter—And How to Track Them. Hootsuite. Retrieved November 11, 2021, from https://blog.hootsuite.com/social-media-metrics/

References

CONTRASTARIA

G. References (VII/VIII)

- Statista. (2021). Global demand for platinum 2005–2021. Retrieved November 19, 2021, from https://www.statista.com/statistics/418216/global-platinum-demand/
- Statista. (2021). Global platinum mine production by country 2010–2020. Retrieved October 18, 2021, from https://www.statista.com/statistics/273645/global-mine-production-of-platinum/
- Statista. (2021). Global production of gold mines 2005–2020. Retrieved October 18, 2021, from https://www.statista.com/statistics/238414/global-gold-production-since-2005/
- Statista. (2021). Global silver demand 2010–2021. Retrieved November 14, 2021, from https://www.statista.com/statistics/1240917/global-silver-demand/
- Statista. (2021). Gold demand globally 2010–2020. Retrieved November 8, 2021, from https://www.statista.com/statistics/267360/gold-demand-worldwide-since-2002/
- Statista. (2021). Industry revenue of "manufacture of jewellery and bijouterie" in Portugal 2012–2025. Retrieved November 15, 2021, from https://www.statista.com/forecasts/905302/manufacture-of-jewellery-and-bijouterie-revenue-in-portugal
- Statista. (2021). Industry revenue of "retail sale of watches and jewellery" in Portugal 2012–2025. Retrieved October 18, 2021, from https://www.statista.com/forecasts/395335/retail-sale-of-watches-and-jewellery-revenue-in-portugal
- Statista. (2021). Jewelry - Portugal. Retrieved November 18, 2021, from https://www.statista.com/outlook/cmo/accessories/watches-jewelry/jewelry/portugal
- Statista. (2021). Portugal: enterprises manufacturing jewelry & bijouterie 2008–2018. Retrieved November 28, 2021, from https://www.statista.com/statistics/385711/number-of-enterprises-in-the-manufacture-of-jewelry-in-portugal/
- Statista. (2021). Portugal: Facebook users 2021, by age group. Retrieved November 29, 2021, from https://www.statista.com/statistics/805474/facebook-users-portugal/
- Statista. (2021). Portugal: Instagram users 2018–2021. Retrieved November 23, 2021, from https://www.statista.com/statistics/1021943/instagram-users-portugal/
- Statista. (2021). World silver mine production 2005–2020. Retrieved November 9, 2021, from https://www.statista.com/statistics/253293/silver-production-volume-worldwide/
- Statista. (n.d.). Statista. Retrieved December 8, 2021, from https://www-statista-com.eu1.proxy.openathens.net/outlook/cmo/accessories/watches-jewelry/portugal?currency=EUR#revenue
- Straubel, B. (2020). Investment Jewelry. Generation Collection. Retrieved December 4, 2021, from https://generation-collection.com/blogs/investment-24k-sustainable-gold-investment-jewelry/investment-jewelry-sustainable-gold
- Straubel, B. (2021). Turning Waste into Gold. Generation Collection. Retrieved December 4, 2021, from https://generation-collection.com/blogs/investment-24k-sustainable-gold-investment-jewelry/the-future-of-gold-is-sustaianble-gold
- Sustainable Jungle. (2021). What Exactly Is Sustainable and Ethical Jewelry? Sustainable Jungle. Retrieved December 4, 2021, from https://www.sustainablejungle.com/sustainable-fashion/sustainable-and-ethical-jewelry/

References

CONTRASTARIA

G. References (VIII/VIII)

- Tecnogold. (2019). How technology is impacting the jewelry industry | Tecnogold.Retrieved November 30, 2021, from https://tecnogold.com.br/how-technology-is-impacting-the-jewelry-industry/
- The Business of Fashion. (2021). The Future of Jewellery: Demand for Sustainably Made Jewellery Will See Explosive Growth. Retrieved November 10, 2021, from https://www.businessoffashion.com/articles/luxury/state-of-fashion-watches-jewellery-industry-report-sustainability-sustainable-fine-jewellery-environment-ethics/
- The Goldsmiths' Company. (2019). Consumer Watch: One third of "gold" jewellery sold online could be fake. The Goldsmiths' Company. Retrieved December 14, 2021, from https://www.assayofficelondon.co.uk/news/consumer-watch-one-third-of-gold-jewellery-sold-online-could-be-fake
- The Navigator Company. (2017). Relatório de Sustentabilidade 2016/17. The Navigator Company. Retrieved November 18, 2021, from http://www.thenavigatorcompany.com/content/download/6615/115341/version/2/file/NVG_RS+2016-17_Web_FINAL.pdf
- The Navigator Company. (2021). Relatório de Sustentabilidade 2020. The Navigator Company. Retrieved November 18, 2021, from http://www.thenavigatorcompany.com/external/agenda2030/docs/navigator-relatorio-de-sustentabilidade-2020.pdf
- Tin Shed Ventures. About. (n.d.). Tin Shed Ventures. Retrieved December 14, 2021, from https://tinshedventures.com/about/
- Todoist. (n.d.). Avoid the "Urgency Trap" with the Eisenhower Matrix. Todoist. Retrieved December 11, 2021, from https://todoist.com/productivity-methods/eisenhower-matrix
- Unilabs. (2021). Sobre Nós. Unilabs. Retrieved December 14, 2021, from https://www.unilabs.pt/unilabs/sobre-nós
- Unilabs. (n.d.). Walk Thru. Unilabs. Retrieved December 14, 2021, from https://www.unilabs.pt/covid-19-walk-thru
- WebFX, Inc. (n.d.). How Much Does It Cost to Advertise on Instagram? | WebFX. WebFX. Retrieved November 29, 2021, from https://www.webfx.com/social-media/how-much-does-it-cost-to-advertise-on-instagram.html
- WordPress.com. (2019). WordPress Cost | WordPress Price | Compare Our Plans. https://wordpress.com/pricing/
- World Bank Group. (2021). Commodity Markets Outlook. Retrieved from September 28, 2021, from https://thedocs.worldbank.org/en/doc/c5de1ea3b3276cf54e7a1dff4e95362b-0350012021/original/CMO-April-2021.pdf
- Wrike. (n.d.). What Is Agile Project Management?. Wrike. Retrieved December 9, 2021, from https://www.wrike.com/project-management-guide/faq/what-is-agile-methodology-in-project-management/

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Abbreviations

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E.1. Appendix I Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
AORP	Associação de Ourivesaria e Joalharia Portuguesa	INE	Instituto Nacional de Estatística
BP	Best Practices	KG	Kilograms
BV	Business Volume	KOD	Kick-Off Document
CAGR	Compound Annual Growth Rate	KPI's	Key Performance Indicators
CCM	Common Control Mark	MWp	Megawatt-peak
Co2	Carbon Dioxide	NGO's	Non-Governmental Organizations
CSR	Corporate Social Responsibility	NHS	National Health System
DWR	Durable Water Repellent	P&L Analysis	Profit and Losses Analysis
ETF's	Exchange-traded funds	R&D	Research and Development
EU	European Union	SEE	State Business Sector
EWN	Edelmetaal Waarborg Nederland B.V.	SEO	Search Engine Optimization
HMA	Hallmarking Act 1973	SWOT	Strengths, Weaknesses, Opportunities, Threats
ICP-MS	Inductive Coupled Plasma Mass Spectrometry	TOWS	Threats, Opportunities, Weaknesses, Strengths
ICP-OES	Inductive Coupled Plasma Optical Emission Spectrometry	TV	Television
IH	Initial Hypothesis	UK	United Kingdom
INCM	Imprensa Nacional Casa da Moeda	YoY	Year by Year

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CONTRASTARIA

Glossary

CONTRASTARIA

E.2. Appendix I Glossary

Word	Definition
24K	24 Karat Gold is 100% pure gold and does not have any other metal mixed
Clusters	Geographic concentration of interconnected businesses, suppliers and associated institutions in a particular field
Cost per click	Total spending associated to each time a visitor clicks on and ad to access further information about a product
Cross-Border Trading	Trade across national borders within different countries
Fact Pack	A set of information that includes the necessary details of an assignment
Gen-Z	Generation born between 1990 and 2010
INCMLAB	Research and Development Laboratory developed by Imprensa Nacional Casa da Moeda
Issue Analysis	An approach to determine the root cause of the problem and understand the "why" the problem exists, and also to determine the recommendation and understand “how” to solve the problem
KOD	the kick-off is an opportunity to orient the team to the work at hand, decide how everyone will work together, and establish common project goals and check-ins
Lead Time	The time between the initiation and completion of a production process
Portaria	Official document signed by a Chief of State
SimaPro	The leading LCA Software Solution, made for sustainability expertise
UniqueMark	Tracing System being developed by Contrastaria
X-Ray (XRF)	Non-destructive analytical technique used to determine the elemental composition of materials

APPENDIX INDEX

The Team

E.3. Appendix I The Team

Academic Background
Bachelor in Management and Economics
Master in Management

Professional Experience
Strategy Consulting
Construction and Sales

Academic Background
Bachelor in Industrial Engineering and Management
Master in Management

Professional Experience
Innovation
Operations Management

Academic Background
Bachelor in Management and Economics
Master in Management

Professional Experience
Strategy Consulting
Operations Management

Source: Team based

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Acknowledgements

CONTRASTARIA

E.4. Appendix I Acknowledgements

- Each part of Contrastaria's team was vital for the elaboration of our work and we were given the opportunity to meet the majority of Contrastaria's employees, contacting with the several existing teams: Management, Customer Service, Hallmarking, Laboratory, Inspection and Innovation. Contrastaria's employees were highly available to support us and showed a deep interest in being involved throughout each step of the process, especially Ana Dias, Paula Pedro, Rosa Bessa and Filipe Guerra who followed our work closely. Furthermore, they provided feedback during our presentations (KOD and Steering Meetings), regular meetings and our weekly visit to Lisbon's Assay Office which was crucial to align expectations and guide our work towards a path that would enable the creation of impactful and implementable recommendations. They always welcomed us to their headquarters which gave us the opportunity of visiting all three facilities: Porto, Gondomar and Lisbon
- Lastly, we cannot stress enough how vital the support of professor Constança Casquinho and Diogo Marques was for our project. Both offered constant advise and guided us in the right direction to create valuable outcomes

Source: Team based

APPENDIX INDEX

Benefits of the Collaboration

E.5. Appendix I Benefits of the Collaboration

CONTRASTARIA	THE TEAM
Resolution of Challenges Access to concrete recommendations and innovative ideas aimed at solving the challenges faced by INCM and therefore ensuring the company's sustainable growth	**Practical and Impacting Experience** Solving real problems in the area of precious metals through the practical application of methodologies and theoretical concepts. Furthermore, the Team will have the opportunity to positively impact the sector and present valuable recommendations to INCM
Access to Talent Connection to a range of highly qualified students with outstanding academic background and professional experience	**Development of Skills** Development of key professional skills in the area of Strategy Consulting and the Precious Metals sector
Increase in Exposure Increased brand exposure through a close contact with the Nova School of Business and Economics community, a university of reference at an national and international level	**Networking Opportunity** Opportunity to network with excellent, highly experienced professionals that offer support and function as a bridge between the students and the company

Source: Team based

APPENDIX INDEX

INCM's Company Structure

CONTRASTARIA

E.6. Appendix I INCM's Company Structure

INCM'S COMPANY STRUCTURE

- **Administrative Council**
  - **Strategic Coordination Commission**
  - **Information Security Coordinator**
  - **Internal Auditing Board of Directors**
  - **Business Development**
    - INCM Lab
    - Commercial Unit
    - Marketing Unit
  - **Autonomous Business Units**
    - Assay Offices and Inspection Unit
    - Official Publications Unit
    - INCMeDOC
    - Culture and Editing Unit
  - **Production Units**
    - INCM Lab
    - Digital Security Unit
    - Coin Unit
  - **Operational Support**
    - Maintenance and Engineering Unit
    - Logistics Service
    - Industrial Laboratory Service
    - Information Systems Unit
    - Purchasing and Business Support Unit
  - **Corporate Centre**
    - Processes, Risk and Compliance Unit
    - Planning and Management Control Unit
  - **Organizational Support**
    - Personnel Development Unit
    - Accounting and Financial Unit
    - Legal Services Unit
    - Maintenance, Constructions and General Support Unit
    - Internal Security Service
    - Communications and Institutional Relations Unit

Source: Client's Internal Data

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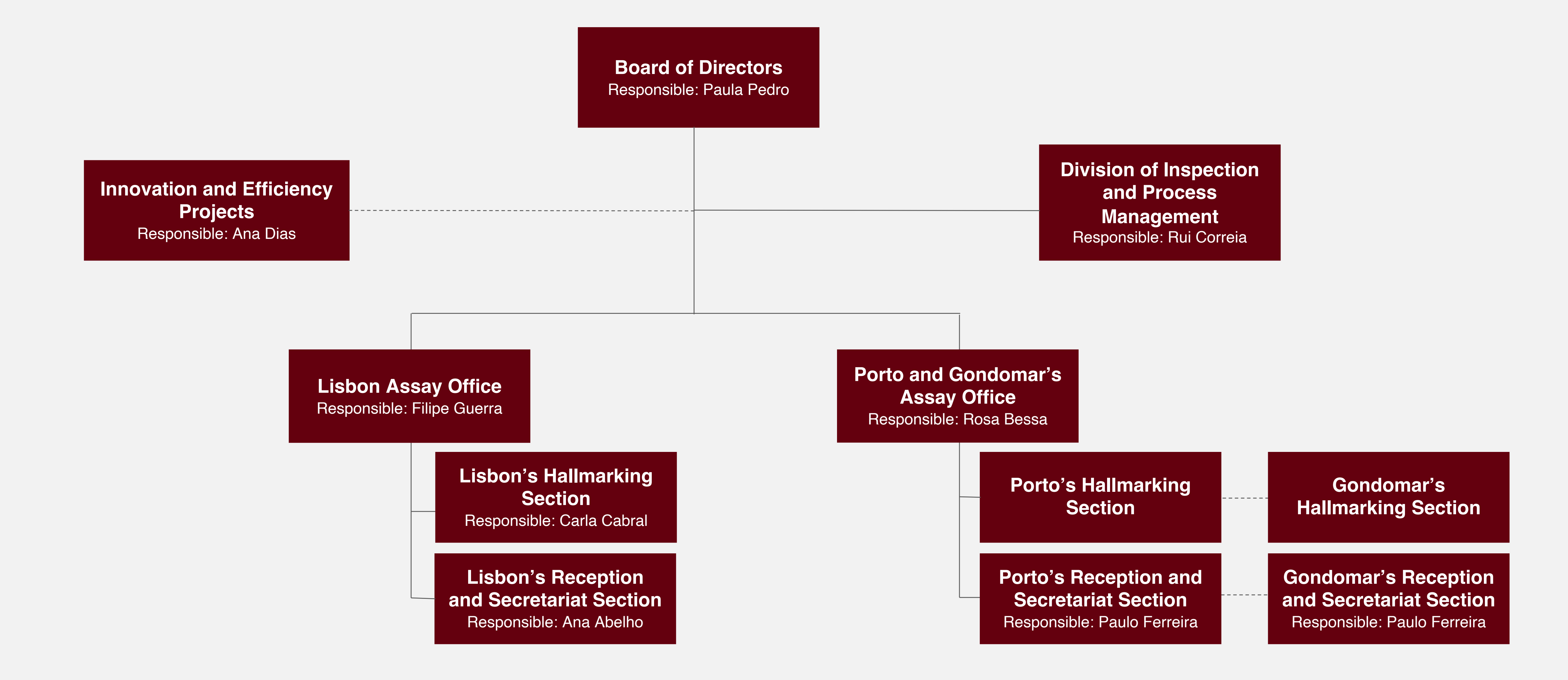
CONTRASTARIA

Contrastaria's Company Structure

E.7. Appendix I Contrastaria's Company Structure

CONTRASTARIA'S COMPANY STRUCTURE



Source: Client's Internal Data

APPENDIX INDEX

CONTRASTARIA

INCM's Strategic Orientations

E.8. Appendix I INCM's Strategic Orientations

INCM'S STRATEGIC ORIENTATIONS

Client-focused growth

Growth of the business through a focus on client satisfaction and anticipation of their existing needs

Internationalization

Leveraging the existing assets and growing both the geographical reach and impact of their solutions

Internal Efficiency

Optimization of the organization and management, production and logistical processes

Innovation

Build differentiating solutions for the safety of citizens and companies

Employee Growth

Strengthen skills, a culture of merit and accountability, and policies for conciliation, diversity and inclusion

Recognition and Notoriety

Re-enforcing the identity of the company and its role in the digital world

Social, Environmental and Cultural Impact

Fulfilling its cultural and social mission, with a special focus on the environment

Source: Client's Internal Data

APPENDIX INDEX

The Goldsmith's Company Assay Office (London)

E.9. Appendix I International Assay Offices Best Practices (United Kingdom) (I/VI)

LONDON

The GOLDSMITHS' Company ASSAY OFFICE

The Goldsmiths' Company was created in 1478 and was the first Assay Office in the UK, which is still in operation today

Laboratory Services:

- **X-Ray Fluorescence Spectrometry Analysis (XRF):** gives a written report of the breakdown of the alloy. This usually takes 5-10 working days
- **Touchstone:** comparative and non-destructive method where the sample's fineness is determined based on the comparison with gold standards of different known fineness.

Hallmarking Services:

- **Manual:** traditional marking struck by punch and hammer
- **Press:** traditional press marking or pneumatic press
- **Laser:** the latest trademark application method using laser devices

Additional Services:

- **Laser Engraving**: for logos, signatures, letters, among others
- **Trace to Hallmark**: brand identification
- **Lab Services:** Gold cupellation, Silver titration, Inductively Coupled Plasma Optical Emission Spectroscopy, Melt
- **Valuations**: evaluation by an expert
- **Punch Making**: punch making service
- **Antique Plate Committee:** identify counterfeit silver items
- **Assistance to Trading Standards:** offer seminars, inspection assistance, tests and statements for test purchases and seizures
- **Imports and Exports**

Innovation Efforts:

- **Heathrow Service:** In 2008, the Goldsmith's Company opened a hallmarking facility at Heathrow Airport. This facility offers a premium service and a convenient service with greater efficiency and lower security risks. This resource was created to satisfy international customer's needs that import, export and distribute metal articles in the UK, in which turnaround time is crucial. It is offered services with the very latest hallmarking technology and equipment, ensuring their position as the premiere service provider

  The Heathrow Service Promises:
  - Fewer steps in the supply chain
  - Decreased turnaround time
  - Diminishes the delivery time from manufacturing to retail site
  - Hold less stock and save money
  - Cutting edge hallmarking technology
  - Brinks secure logistics services
  - Fully insured regarding the distribution to other destinations
  - Unmatched efficiency

Digital Efforts:

- **Website:** Intuitive website with informative videos for consumers and clients, complemented with an intuitive customer journey
- **Social Media**: Strong presence on social media accounts such as Instagram, Facebook, Twitter

Source: The Goldsmith's Company Assay Office (2021)

Birmingham Assay Office

CONTRASTARIA

E.9. Appendix I International Assay Offices Best Practices (United Kingdom) (II/VI)

BIRMINGHAM

ASSAY OFFICE BIRMINGHAM

Assay Office Birmingham was founded in 1773, when the city and some of its most famous businessmen were playing an important role in the Industrial Revolution

Laboratory Services:

- **X-Ray Fluorescence Spectrometry Analysis (XRF):** gives a written report of the breakdown of the alloy. This usually takes 5-10 working days
- **Touchstone:** comparative and non-destructive method where the sample's fineness is determined based on the comparison with gold standards of different known fineness

Hallmarking Services:

- **Manual:** traditional marking struck by punch and hammer
- **Press:** traditional press marking or pneumatic press
- **Laser:** the latest trademark application method using laser devices

Additional Services:

ANCHORCERT® ANALYTICAL — Provides testing, certification and analysis services by experts in various sectors

ANCHORCERT® GEM LAB — Gemmological laboratory that analyses the authenticity of precious stones and pearls

ANCHORCERT® ACADEMY — Allows the training of individuals, through the provision of informative and practical courses

SAFEGUARD® INDEPENDENT JEWELLERY VALUATION SERVICE — Provides a valuation service for silver jewellery, watches and silverware

Innovation Efforts:

- **Hope Competition: t**he Assay Office challenged children between 7 and 16 years to create a logo that means "hope" for the future. The 'hope' logo will be used as an optional mark that can be applied to jewellery alongside a legal mark
- **Rainbow Logo Mark: t**he Assay Office has released a logo for a rainbow to raise funds for the NHS during the COVID-19 pandemic

THANK YOU

- **Express service:** collection and delivery of precious metals articles, at an additional cost
- **Heritage Hub**: the Assay Office shares expertise and experiences with the public, by organizing exhibitions and sharing their archives concerning precious metal in a digital format

Digital Efforts:

- **Website:** Intuitive website with informative videos for consumers and clients, complemented with an intuitive customer journey
- **Social Media**: Strong presence on social media accounts such as Instagram, Facebook, Twitter, LinkedIn, and it's the only one with an YouTube account, where informative videos are shared

Source: Birmingham Assay Office (2021)

Sheffield Assay Office

CONTRASTARIA

E.9. Appendix I International Assay Offices Best Practices (United Kingdom) (III/VI)

SHEFFIELD

There has been an Assay Office in Sheffield since 1773, when local goldsmiths asked Parliament for the right to analyze silver in Sheffield

Laboratory Services:

- **X-Ray Fluorescence Spectrometry Analysis (XRF):** gives a written report of the breakdown of the alloy. This usually takes 5-10 working days
- **Touchstone:** comparative and non-destructive method where the sample's fineness is determined based on the comparison with gold standards of different known fineness
- **ICP-OES, ICP-MS, Nitrogen Oxygen Analyzer:** modern instrumentation precise elemental compositions can be reported tailored to the customer's specific needs

Hallmarking Services:

- **Manual:** traditional marking struck by punch and hammer
- **Laser:** the latest trademark application method using laser devices

Additional Services:

- Analysis of the chemical composition of 3D printing powders
- Analytical Quality Control (AQC) that guarantee the quality of laboratory tests
- Nickel, lead and cadmium test
- Mercury screening to assess mercury exposure of dentists and industrial workers
- Specialized diamond verification service, which verifies if diamonds are natural

Innovation Efforts:

- **MyScrapJewellery.com:** The UK's only independent gold testing and selling service. This service provides assurance and protection to the general public when selling their jewellery, as the website offers an impartial, reliable, stress free valuation service while maintaining a an independent and impartial position

Step 1

Simply package up your jewellery and post it to the Sheffield Assay Office

Step 2

Your jewellery will be independently and non-destructively checked

Step 3

The team will work to secure the best price from their approved bullion dealer

Step 4

Finally, the team will discuss any sale prices with the client before the jewellery is released

Digital Efforts:

- **Website:** Confused website with scattered information
- **Social Media**: Highly active LinkedIn, Facebook and Twitter accounts

Source: Birmingham Assay Office (2021)

Edinburgh Assay Office

CONTRASTARIA

E.9. Appendix I International Assay Offices Best Practices (United Kingdom) (IV/VI)

EDINBURGH

The Edinburgh Assay Office has been testing and marking precious metals since 1457. They have been recognized as the Assay Office of choice, winning UK awards for customer service and quality of workmanship

Laboratory Services:

- **X-Ray Fluorescence Spectrometry Analysis (XRF):** gives a written report of the breakdown of the alloy. This usually takes 5-10 working days
- **Touchstone:** comparative and non-destructive method where the sample's fineness is determined based on the comparison with gold standards of different known fineness

Hallmarking Services:

- **Manual:** traditional marking struck by punch and hammer
- **Press:** traditional press marking or pneumatic press
- **Laser:** the latest trademark application method using laser devices

Additional Services:

- **Laser Engraving**: for logos, signatures, letters, among others
- **Laboratory services:** for testing precious metal, nickel, stain resistance, sulphur, packaging and toxicity analysis
- **Consulting services** for creating custom solutions
- **Efficient distribution service** without the need for storage

Innovation Efforts:

- **Assay Assured:** In 2012, Assay Assured was launched, the world's first and only online trust system for jewellery e-tailers with an Assay Office guarantee. The system protects online shoppers from counterfeits, and helps brands gain consumer trust

ASSAY ASSURED JEWELLERY RETAILER

- **Virtual Assay Office**: The Virtual Assay Office is the world's leading online order shipping and tracking system. The customer is aware of the entire process and can check if the order is being processed, if it passed the test, check the return date and much more. It is the only UK Office with this system

EDINBURGH ASSAY OFFICE

Digital Efforts:

- **Website:** Intuitive and user-friendly website
- **Social Media**: No presence on any Social Media platform
- It is the Assay Office with greater and significant digital efforts amongst the other Assay Offices in England

Innovation Award for adapting to the digital age (2016)

Source: The Goldsmith's Company Assay Office (2021)

Edelmetaal Waarborg Nederland & Cookson-CLAL

CONTRASTARIA

E.9. Appendix I International Assay Offices Best Practices (The Netherlands & France) (V/VI)

THE NETHERLANDS

EDELMETAAL WAARBORG NEDERLAND

As of 11 March 2002 Assay Office EWN (Edelmetaal Waarborg Nederland B.V.) has been certified by the Ministry of Economic Affairs as a legal entity

Laboratory Services:

- **X-Ray Fluorescence Spectrometry Analysis (XRF):** gives a written report of the breakdown of the alloy. This usually takes 5-10 working days
- **Touchstone:** comparative and non-destructive method where the sample's fineness is determined based on the comparison with gold standards of different known fineness
- **Fire Assay:** a process in which base metal and contaminants are separated from the precious metals gold and silver
- **Silver Titration:** used to determine silver contents very accurately. A precise weight of a sample is dissolved in nitric acid. Then it is titrated with an NaCl solution (table salt solution)
- **ICP-OES:** modern instrumentation precise elemental compositions can be reported tailored to the customer's specific needs

Hallmarking Services:

- **Manual:** traditional marking struck by punch and hammer
- **Press:** traditional press marking or pneumatic press
- **Laser:** the latest trademark application method using laser devices

Additional Services/ Innovation Efforts:

- Provides inscription services on wedding rings or watches
- Logistic system with continuous monitoring from product arrival to departure

FRANCE

Cookson-CLAL
Heimerle + Meule Group

The preferred choice of jewellers since 1834

Laboratory Services:

- **X-Ray Fluorescence Spectrometry Analysis (XRF):** gives a written report of the breakdown of the alloy. This usually takes 5-10 working days
- **Touchstone:** comparative and non-destructive method where the sample's fineness is determined based on the comparison with gold standards of different known fineness
- **ICP-OES:** modern instrumentation precise elemental compositions can be reported tailored to the customer's specific needs

Hallmarking Services:

- **Manual:** traditional marking struck by punch and hammer
- **Laser:** the latest trademark application method using laser devices

Additional Services/ Innovation Efforts:

- **Chemical breakdown:** recovered metals are credited to the weight account or bought back
- **Consulting Services**
- **Customer training:** Contrast and Marking Technician, Quality in Laboratories, and others
- **Refining, Processing and Repurchase** of Precious Metals
- **Several certifications**: Responsible Jewellery Council, Kimberley Process, quality certification and others

Source: The Goldsmith's Company Assay Office (2021)

Saveco & The Company of Goldsmith's of Dublin

E.9. Appendix I International Assay Offices Best Practices (Spain & Ireland) (VI/VI)

SPAIN

Created in 1988, it is the 1st authorized analysis and contrast laboratory in Andalusia

Hallmarking Services:

- **Manual:** traditional marking struck by punch and hammer
- **Laser:** the latest trademark application method using laser devices
- **Tags**

Digital Efforts:

- **Website:** Confused consumer journey, being difficult to find information regarding the firm's activity
- **Social Media:** No presence

Additional Services:

- Consulting Services
- Customer training offer
  - Contrast and Marking Technician
  - Management Systems Auditor
  - Quality in Laboratories
  - Industrial Product Safety

Innovation Efforts:

- **Collaborates with other laboratories**: technology centres and universities to develop several R&D studies
- **Active in a wide range of sectors:** such as automotive, prosthetics, raw materials, antiques, and many more
- **Differentiated Marking Method:** Use of tags, which acts as their competitive advantage

IRELAND

The Company of Goldsmiths of Dublin governs the Assay Office which is situated in Dublin Castle. The Company was established and incorporated by royal charter of Charles I on ember 1637

Laboratory Services:

- **X-Ray Fluorescence Spectrometry Analysis (XRF):** gives a written report of the breakdown of the alloy. This usually takes 5-10 working days
- **Fire Assay:** a process in which base metal and contaminants are separated from the precious metals gold and silver

Hallmarking Services:

- **Manual:** traditional marking struck by punch and hammer
- **Press:** traditional press marking or pneumatic press
- **Laser:** the latest trademark application method using laser devices

Additional Services

- **Antique plate committee:** Identify counterfeit silver items
- **Hallmark identification:** The Dublin Assay Office can identify and explain all the marks for you
- **Historical queries:** The Assay Office has a have extensive archives going back to 1637
- **Sell the famous "Dublin Assay Office Gold Bullion Bars"**

Innovation Efforts:

- The Company operates a deposit account scheme designed to facilitate customers who submit parcels for assay and hallmarking daily or frequently

Digital Efforts:

- **Website:** Intuitive and well-designed website
- **Social Media**: No presence

Source: The Goldsmith's Company Assay Office (2021)

APPENDIX INDEX

Advertising Prototypes (Flyers & Cards)

CONTRASTARIA

E.10. Appendix I Advertising Prototypes (I/IV)

FLYERS

CARD

Source: Team based

Advertising Prototypes (Price Tags & Physical Newspaper)

E.10. Appendix I Advertising Prototypes (II/IV)

CONTRASTARIA

PRICE TAGS

Source: Team based

Advertising Prototypes (Social Media)

CONTRASTARIA

E.10. Appendix I Advertising Prototypes (III/IV)

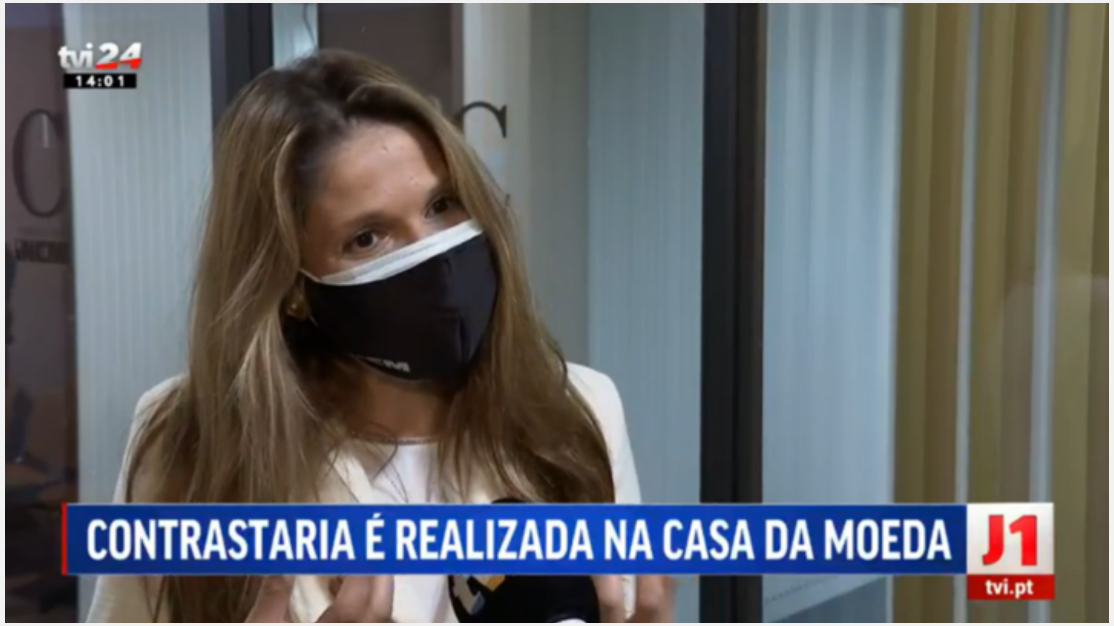
SOCIAL MEDIA

Source: Team based

Advertising Prototypes (TV Report & TV Commercial)

CONTRASTARIA

E.10. Appendix I Advertising Prototypes (IV/IV)

TV REPORT	TV COMMERCIAL
	

https://youtu.be/CRs5nz3Tstc

Source: Team based

APPENDIX INDEX

CONTRASTARIA

End-consumer In-depth Survey

CONTRASTARIA

E.11. Appendix I End-consumer In-depth Survey (I/XV)

To analyse the consumption patterns of jewellery items and understand the overall awareness regarding hallmarks and Contrastaria's mission, questions were adapted according to the profile of the consumer

Section 1	Section 2	Section 3	Section 4
General Questions	Precious metal articles consumers	Precious metal consumers that are familiar with hallmarks	Individuals that are familiar with Contrastaria's mission
	Precious metal articles non-consumers	Individuals that are not familiar with hallmarks	Individuals that are not familiar with Contrastaria's mission
		Precious metal articles non-consumers that are familiar with hallmarks	

Source: Team based

End-consumer In-depth Survey

CONTRASTARIA

E.11. Appendix I End-consumer In-depth Survey (II/XV)

QUESTIONS OVERVIEW

1. General Questions

1. Age
2. Gender
3. Occupation
4. If you had to select one figure to characterize the Jewellery and Watch Sector which one would you select?
5. How frequently do you purchase jewellery made of poor metals, such as stainless steel or copper? (ex: rings, necklaces, watches)
6. How frequently do you purchase jewellery made of gold or silver? (ex: rings, necklaces, watches)

2.1. Precious metal items consumers

1. Why do you purchase jewellery items made of gold or silver?
2. Do you purchase these items to offer them as gifts or for your personal use?
3. Where do you usually purchase jewellery made of gold or silver?
4. In case you answered online, please indicate what channel type you use to purchase the items.
5. In case you answered online, please indicate whether you use national or international platforms.
6. In case you answered online, what motivates your choice?
7. In case you don't use online platforms to purchase gold/silver jewellery items, what hinders you?
8. Are you familiarized with hallmarks?

3.1. Precious metal consumers that are familiar with hallmarks

1. How did you become acquainted with hallmarks?
2. Are hallmarks relevant to you?
3. During the purchasing act do you check if the gold/silver jewellery items are hallmarked?
4. Are hallmarks relevant to you?
5. Do you know who is responsible for hallmarking precious metal jewellery items in Portugal?

2.2.Precious metal articles non-consumers

1. For what reason do you prefer not to purchase gold/silver jewellery items?
2. Are you familiarized with hallmarks?

Source: Team based

End-consumer In-depth Survey

E.11. Appendix I End-consumer In-depth Survey (III/XV)

CONTRASTARIA

QUESTIONS OVERVIEW

3.2. Precious metal articles non-consumers that are familiar with hallmarks

1. How did you become acquainted with hallmarks?
2. Are hallmarks relevant to you?
3. Did you know that demanding to see the hallmarks during the purchasing act is a consumer's right?
4. Do you know who is responsible for hallmarking precious metal jewellery items in Portugal?

3.3. Individuals that are not familiar with hallmarks

1. Now that you're acquainted with hallmarks, do you think that they are relevant?
2. Did you know that demanding to see the hallmarks during the purchasing act is a consumer's right?
3. Do you know who is responsible for hallmarking precious metal jewellery items in Portugal?

4.1. Individuals that are familiar with Contrastaria's mission

1. How did you become acquainted with the Portuguese Assay Office?
2. Do you think it is a relevant subject for the general public?
3. What is, in your opinion, the best way to promote the Portuguese Assay Office?
4. What social network would you use to stay up to date with the Assay Office's activity?

4.2. Individuals that are not familiar with Contrastaria's mission

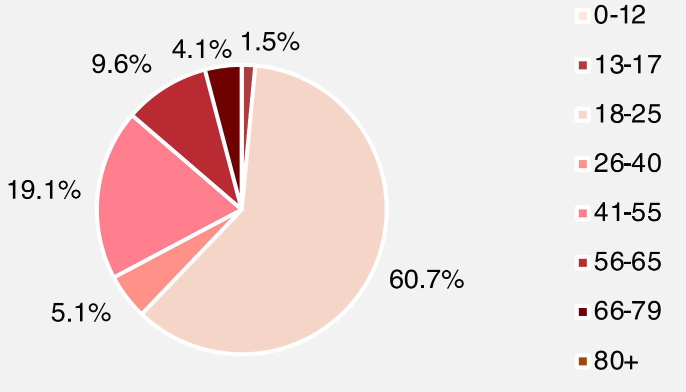
1. Now that you're acquainted with the Portuguese Assay Office, do you think it is a relevant subject for the general public?
2. How would you like to become familiarized with the Assay Office?
3. What social network would you use to stay up to date with the Assay Office's activity?
4. Now that you're acquainted with the Portuguese Assay Office will you pay more attention to the hallmarks when purchasing gold/silver jewellery items?

Source: Team based

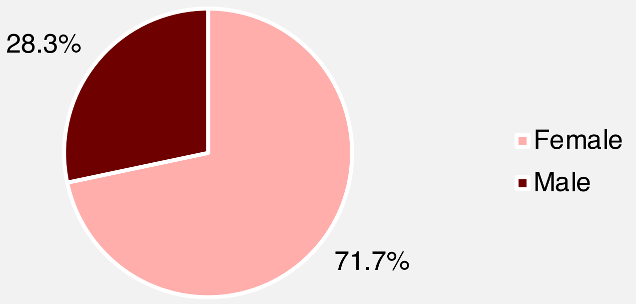
End-consumer In-depth Survey

E.11. Appendix I End-consumer In-depth Survey (1. General Questions) (IV/XV)

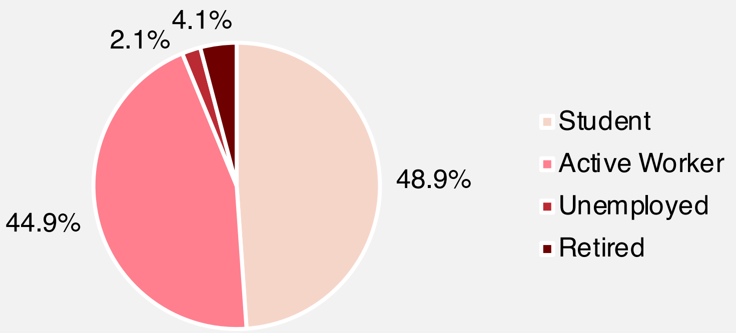
Question 1 – Age group



Question 2 – Gender



Question 3 – Occupation

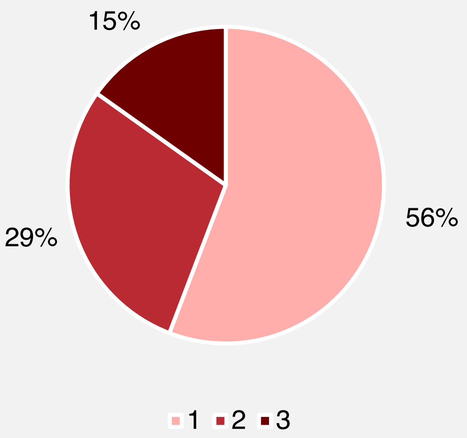


Question 4 – If you had to select one figure to characterize the Jewellery and Watch Sector which one would you select?

1 – Woman over 65 years old who has significant knowledge and experience in the area. She is quite energetic and flashy

2 - Woman with around 30 years of age who is creative, cheerful and innovative

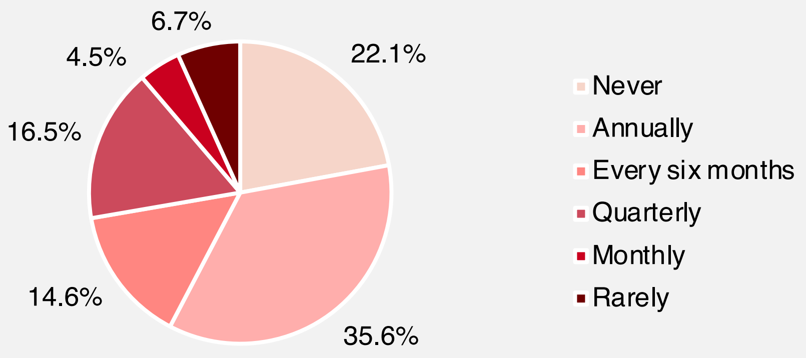
3 – Older man who is not very innovative and has a more serious posture



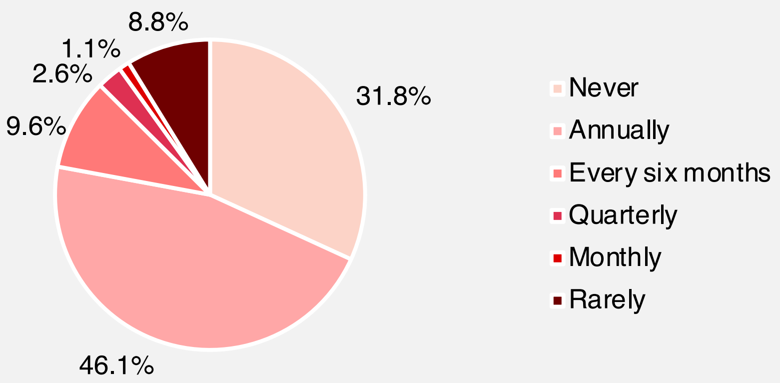
End-consumer In-depth Survey

E.11. Appendix I End-consumer In-depth Survey (1. General Questions) (V/XV)

Question 5 – How frequently do you purchase jewellery made of poor metals, such as stainless steel or copper? (ex: rings, necklaces, watches)



Question 6 – How frequently do you purchase jewellery made of gold or silver? (ex: rings, necklaces, watches)



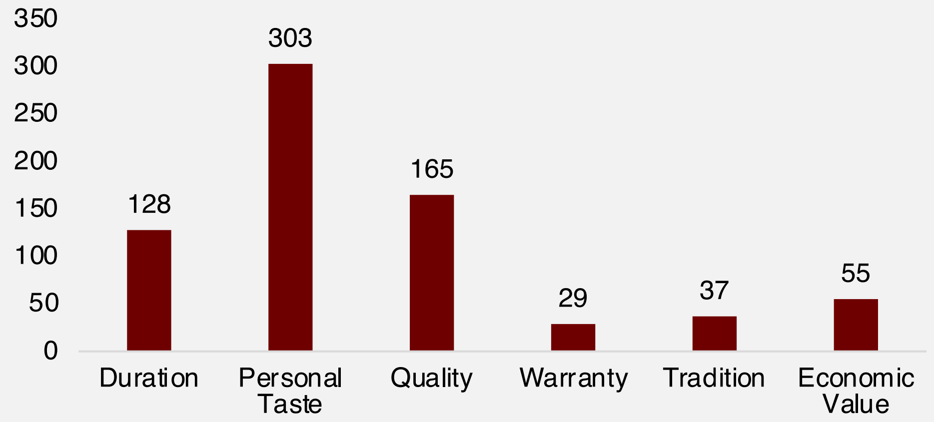
Source: Survey

End-consumer In-depth Survey

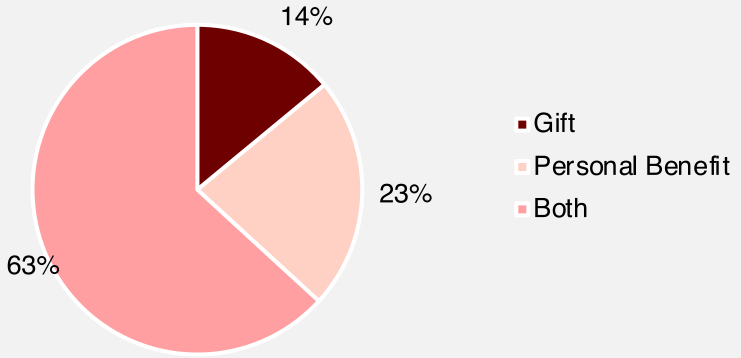
CONTRASTARIA

E.11. Appendix I End-consumer In-depth Survey (2.1 Precious metal items consumers) (VI/XV)

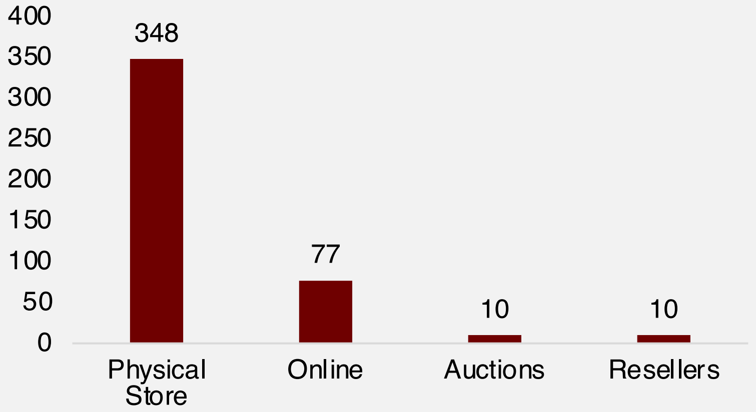
Question 1 – Why do you purchase jewellery items made of gold or silver?



Question 2 – Do you purchase these items to offer them as gifts or for your personal use?



Question 3 – Where do you usually purchase jewellery made of gold or silver?



Source: Survey

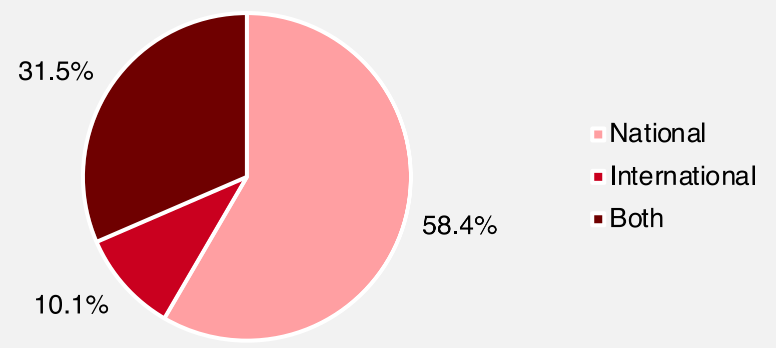
End-consumer In-depth Survey

E.11. Appendix I End-consumer In-depth Survey (2.1. Precious metal items consumers) (VII/XV)

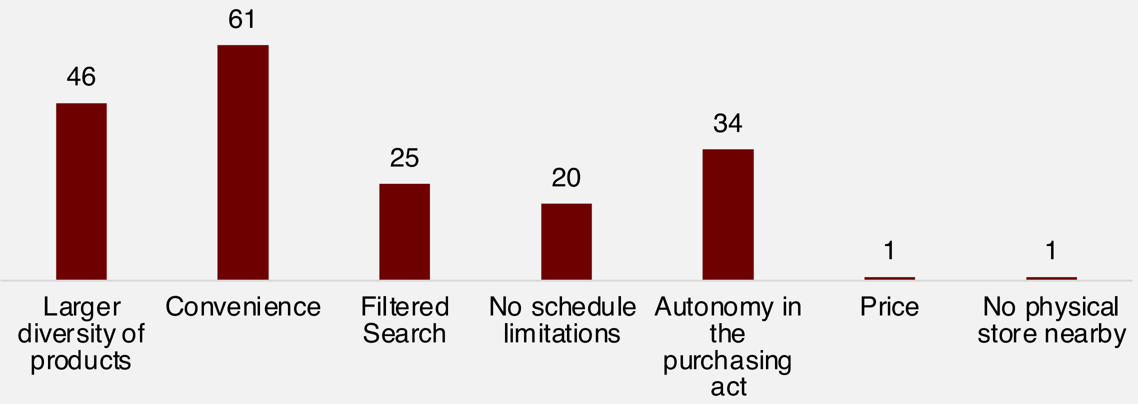
Question 4 – In case you answered online, please indicate what channel type you use to purchase the items

- Alma
- AMORITA store
- Ana Joalheiros
- Anje Jewels
- Apuro
- Arcane
- Arte Nova
- Astrid & Miyu
- Bancas de rua
- BlueBird
- Boheme
- Boutique dos Relógios
- By Inês Rochinha
- Cata Vassalo
- Cinco Store
- Crazy Factory
- Daniel Wellington
- Deluem
- Gucci
- HLC
- Hugo Boss
- J & Co.
- Jess Stor
- Jo del mare
- Lojas no Instagram
- Magnolia
- Maria Avillez
- Matilda
- Mchoices
- Minty Dot
- Msteel
- Noya
- Omnia
- Our Sins
- Ourivesaria Portugal
- Pampa Mia
- Pandora
- Parfois
- PDPaola
- Pipe
- PLT Jewellery
- Portugal Jewels
- Rosarinho Cruz
- Shein
- Stanisporto
- Stradivarius
- Swarovski
- Tashi
- The One
- Time
- Tous
- Vidal & Vidal
- Your lovely breeze
- Zadig
- Zhou
- 99 cool k
- 100Pedras

Question 5 – In case you answered online, please indicate whether you use national or international platforms



Question 6 – In case you answered online, what motivates your choice?

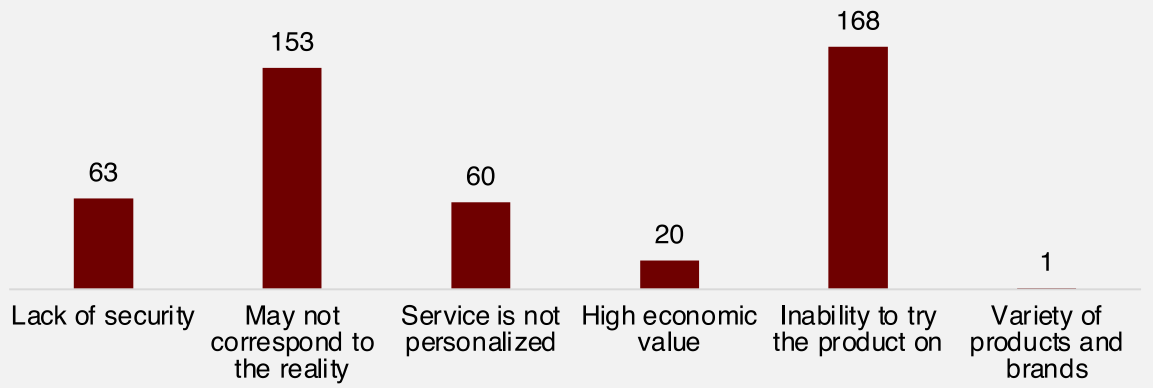


Source: Survey

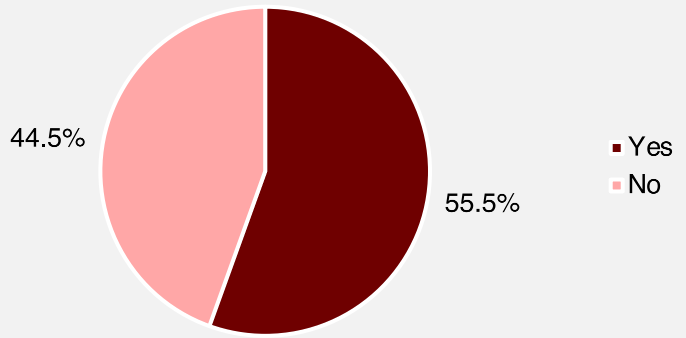
End-consumer In-depth Survey

E.11. Appendix I End-consumer In-depth Survey (2.1. Precious metal items consumers) (VIII/XV)

Question 7 – In case you don't use online platforms to purchase gold/silver jewellery items, what hinders you?



Question 8 – Are you familiarized with hallmarks?



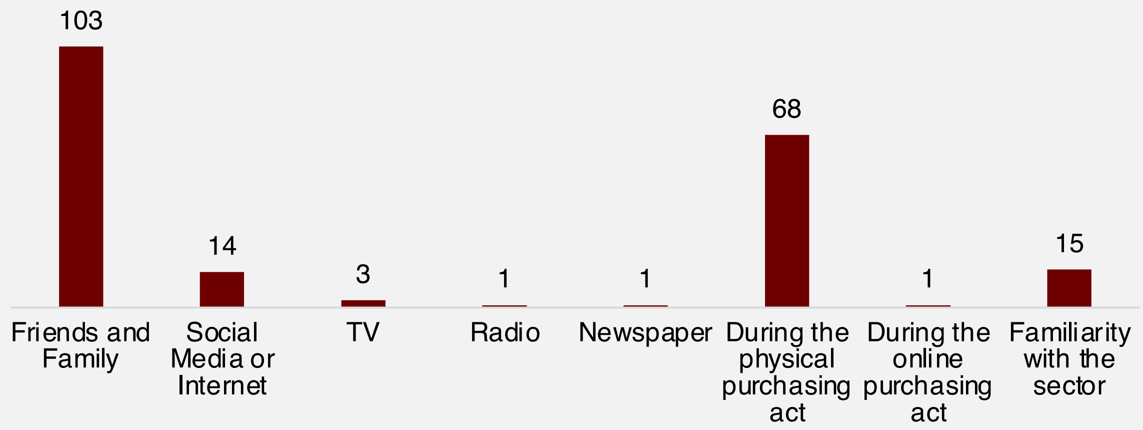
Source: Survey

End-consumer In-depth Survey

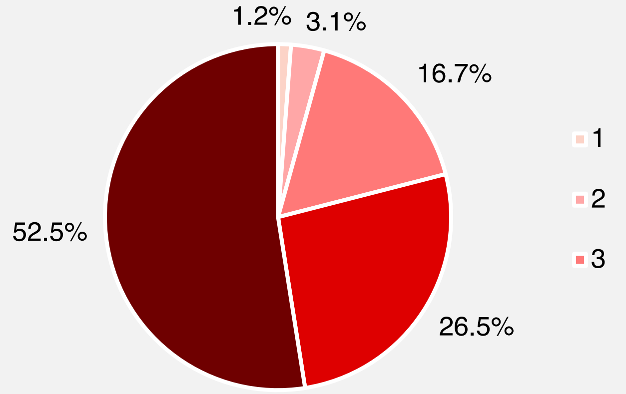
CONTRASTARIA

E.11. Appendix I End-consumer In-depth Survey (3.1. Precious metal consumers that are familiar with hallmarks) (IX/XV)

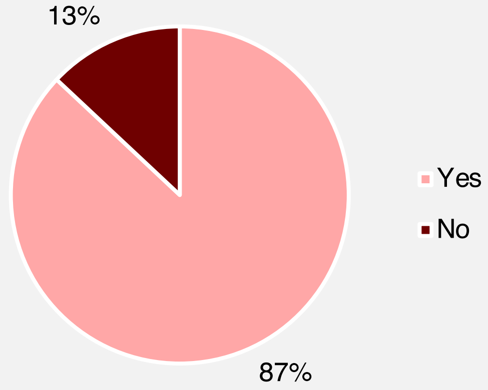
Question 1 – How did you become acquainted with hallmarks?



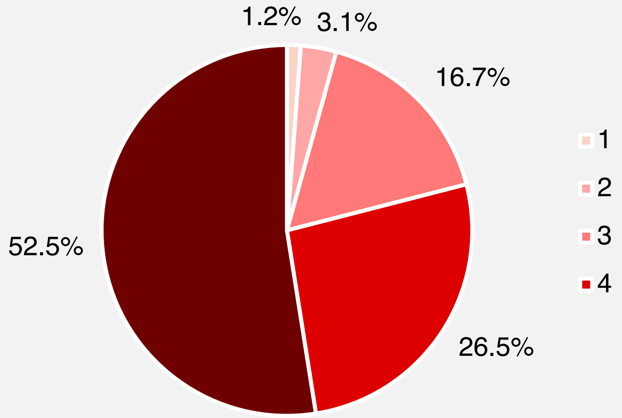
Question 2 – Are hallmarks relevant to you?



Question 3 – During the purchasing act do you check if the gold/silver jewellery items are hallmarked?



Question 4 – Are hallmarks relevant to you?

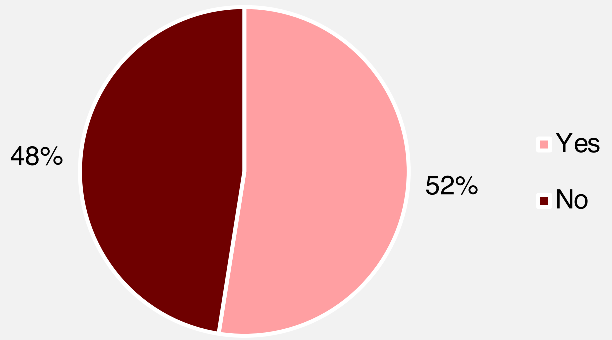


Source: Survey

End-consumer In-depth Survey

E.11. Appendix I End-consumer In-depth Survey (3.1. Precious metal consumers that are familiar with hallmarks) (X/XV)

Question 5 – Do you know who is responsible for hallmarking precious metal jewellery items in Portugal?



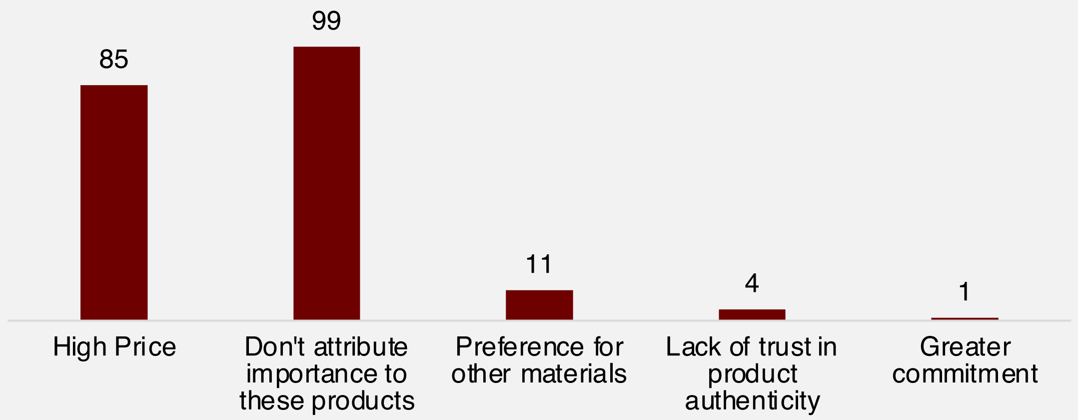
Source: Survey

End-consumer In-depth Survey

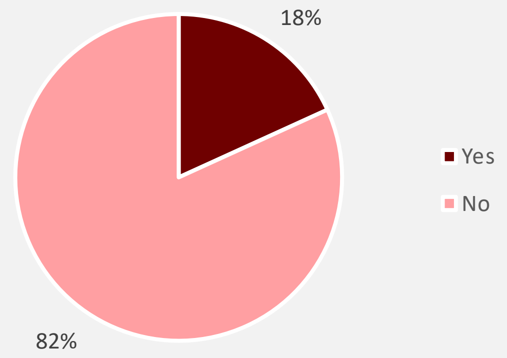
CONTRASTARIA

E.11. Appendix I End-consumer In-depth Survey (2.2. Precious metal articles non-consumers) (XI/XV)

Question 1 – For what reason do you prefer not to purchase gold/silver jewellery items?



Question 2 – Are you familiarized with hallmarks?



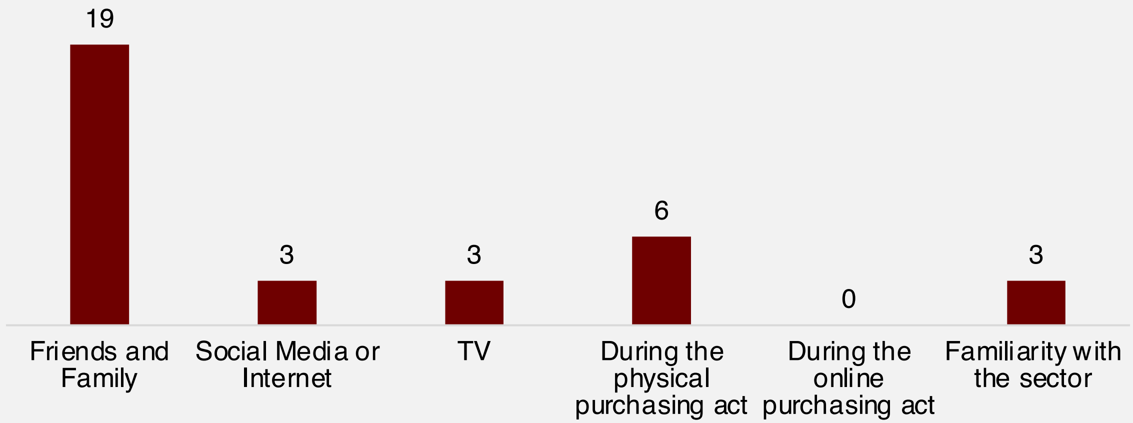
Source: Survey

End-consumer In-depth Survey

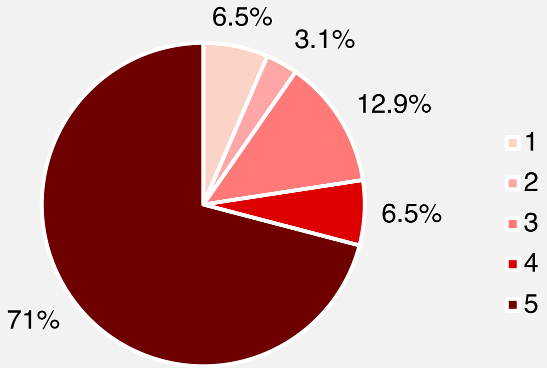
CONTRASTARIA

E.11. Appendix I End-consumer In-depth Survey (3.2. Precious metal articles non-consumers that are familiar with hallmarks) (XII/XV)

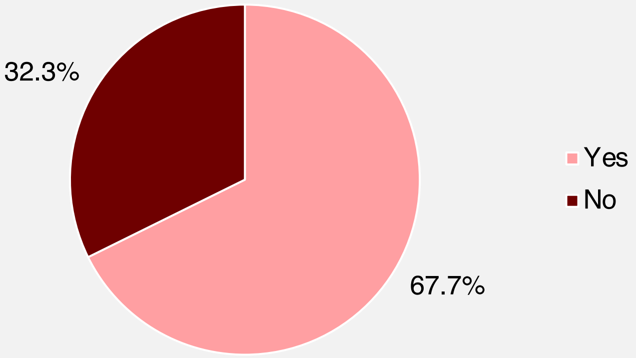
Question 1 – How did you become acquainted with hallmarks?



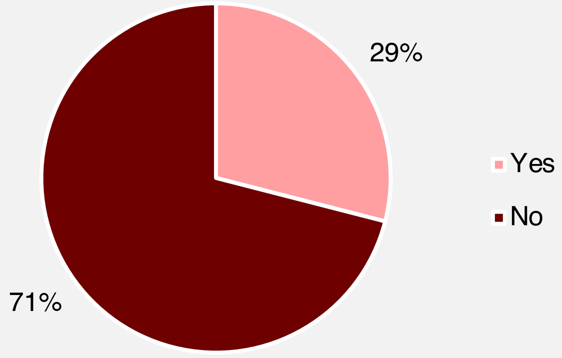
Question 2 – Are hallmarks relevant to you?



Question 3 – Did you know that demanding to see the hallmarks during the purchasing act is a consumer's right?



Question 4 – Do you know who is responsible for hallmarking precious metal jewellery items in Portugal?

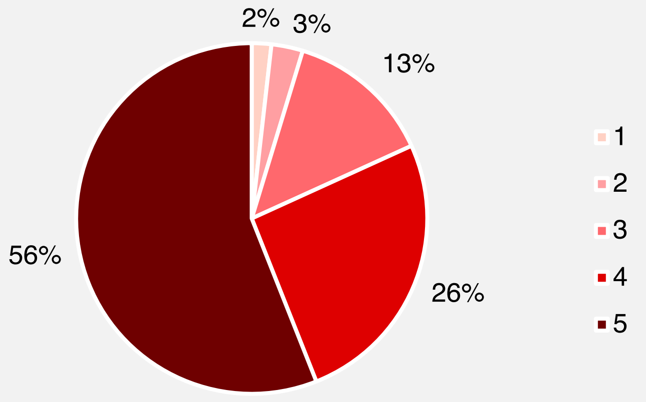


Source: Survey

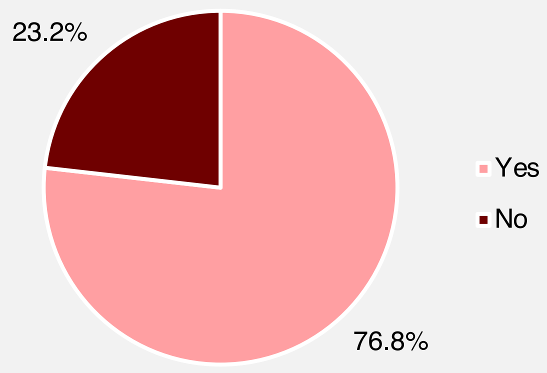
End-consumer In-depth Survey

E.11. Appendix I End-consumer In-depth Survey (3.3. Individuals that are not familiar with hallmarks) (XIII/XV)

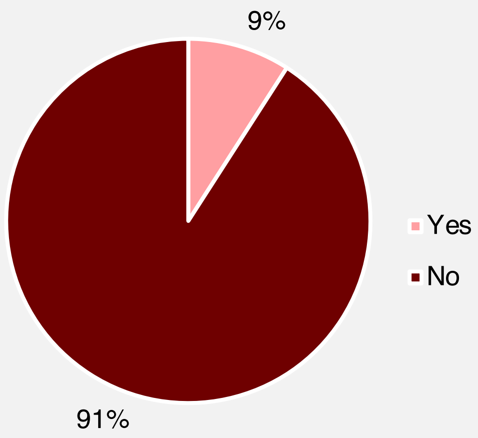
Question 1 – Now that you're acquainted with hallmarks, do you think that they are relevant?



Question 2 – Did you know that demanding to see the hallmarks during the purchasing act is a consumer's right?



Question 3 – Do you know who is responsible for hallmarking precious metal jewellery items in Portugal?

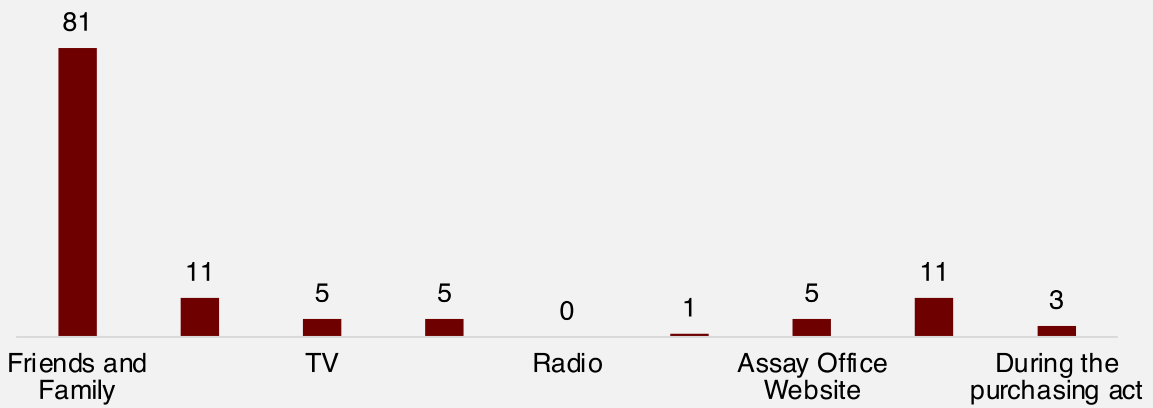


Source: Survey

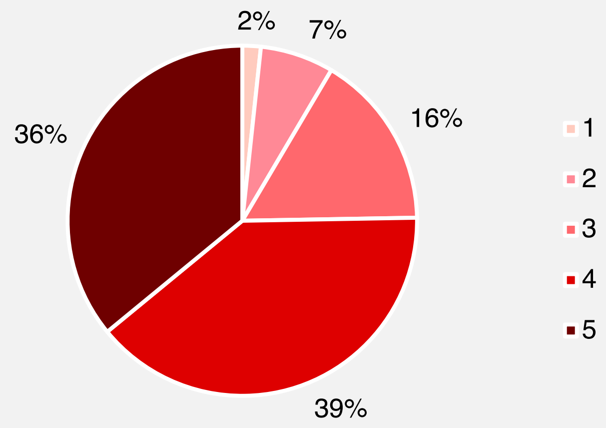
End-consumer In-depth Survey

E.11. Appendix I End-consumer In-depth Survey (4.1. Individuals that are familiar with Contrastaria's mission) (XIV/XV)

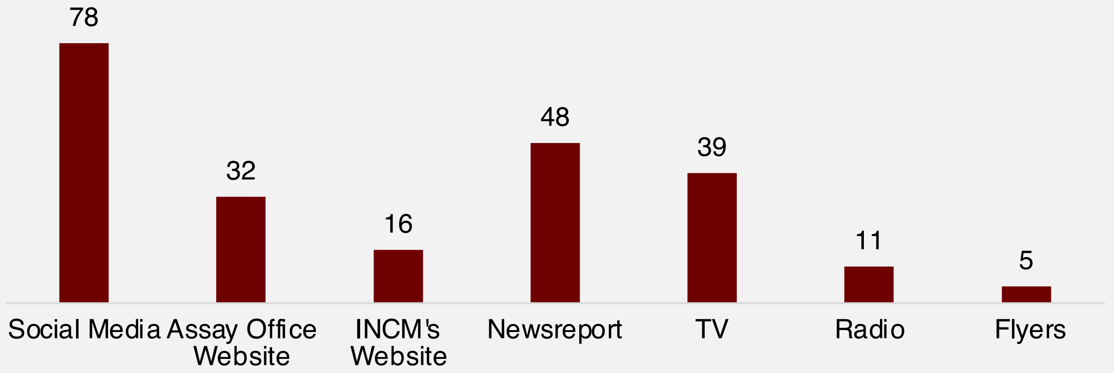
Question 1 – How did you become acquainted with the Portuguese Assay Office?



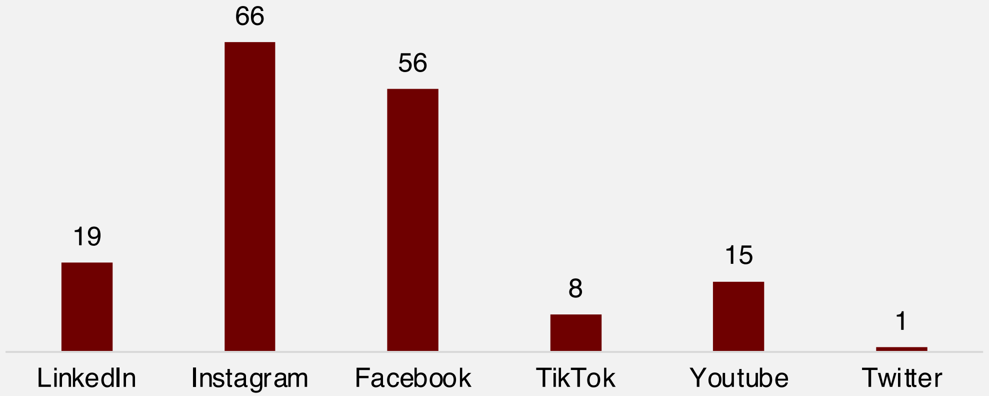
Question 2 – Do you think it is a relevant subject for the general public?



Question 3 – What is, in your opinion, the best way to promote the Portuguese Assay Office?



Question 4 – What social network would you use to stay up to date with the Assay Office's activity?

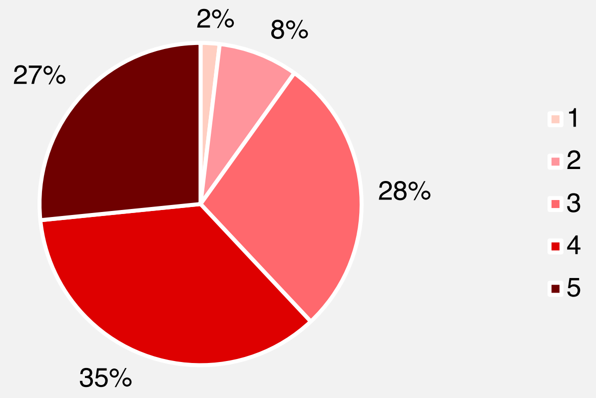


Source: Survey

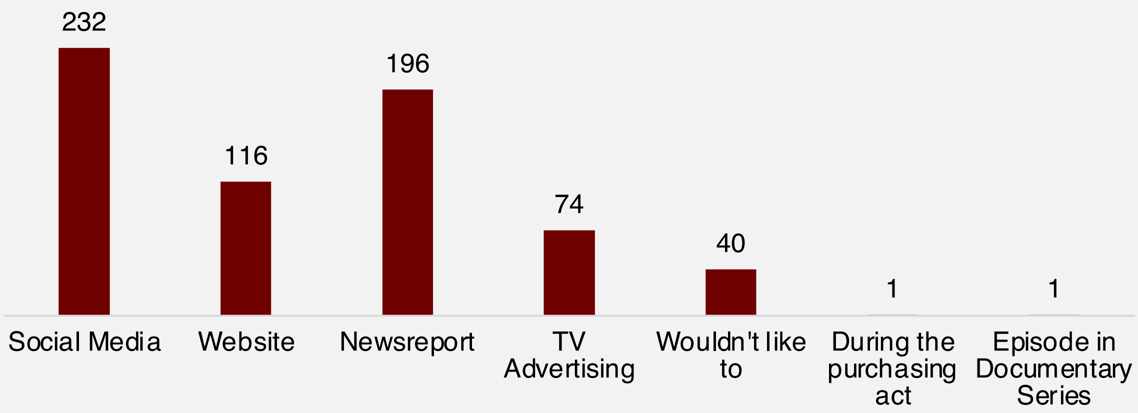
End-consumer In-depth Survey

E.11. Appendix I End-consumer In-depth Survey (4.2. Individuals that are not familiar with Contrastaria's mission) (XV/XV)

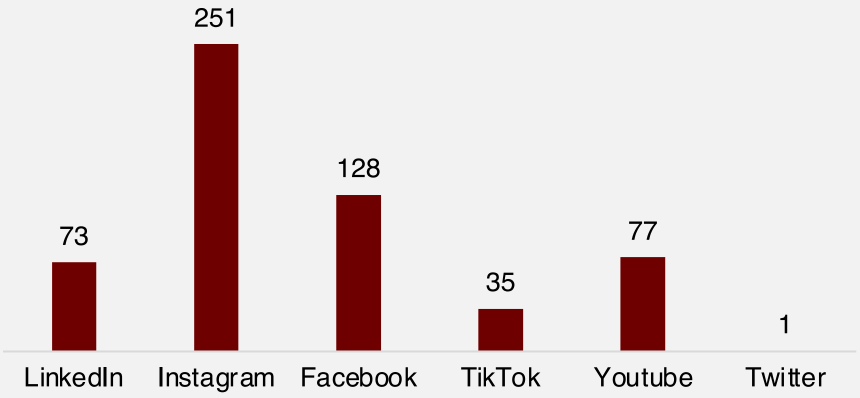
Question 1 – Now that you're acquainted with the Portuguese Assay Office, do you think it is a relevant subject for the general public?



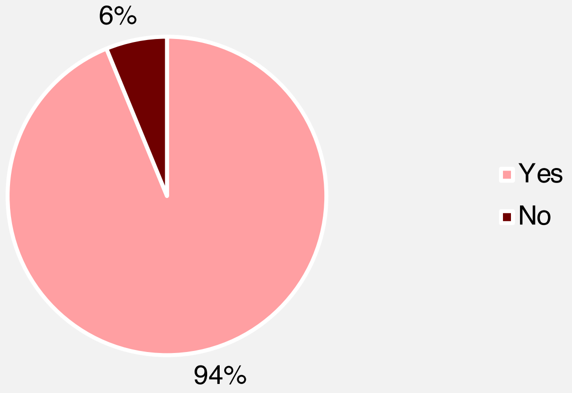
Question 2 – How would you like to become familiarized with the Assay Office?



Question 3 – What social network would you use to stay up to date with the Assay Office's activity?



Question 4 – Now that you're acquainted with the Portuguese Assay Office will you pay more attention to the hallmarks when purchasing gold/silver jewellery items?



Source: Survey

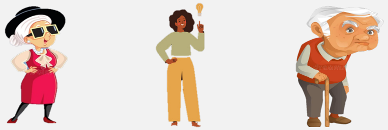
APPENDIX INDEX

End-consumer In-depth Interviews

E.12. Appendix I End-consumer In-depth Interviews

END-CONSUMER IN-DEPTH INTERVIEWS SCRIPT

1. How frequently do you purchase jewellery items made of gold or silver?
2. How frequently do you purchase jewellery items made of poor metals? (ex: stainless steel)
3. Why do you purchase jewellery items made of gold or silver? What attributes do you value most?
4. Do you purchase your jewellery items made of gold or silver through online channels, physical stores or both?
    1. In case the interviewee does not purchase his/her jewellery via online channels due to lack of security: How would you start purchasing the items online? What measures would need to be in place for you to consider this a viable option?
    2. In case the interviewee purchases his/her jewellery via online channels: What channels do you usually purchase your jewellery from (website, Instagram, etc.)? How to you guarantee the item's authenticity?
5. How would you describe the Jewellery and Watch Sector?
6. If the Jewellery and Watch Sector was a person, how would you describe it? What would be the gender, age and personality of that person
7. Does your description correspond to one of these personas?



1 2 3

8. Have you heard of hallmarks?
9. Did you know that hallmarks ensure the protection of precious metal items consumers during the purchasing act?
10. Did you know that demanding to see the hallmarks during the purchasing act is a consumer's right?
11. Are you familiarized with the entity responsible for hallmarking these items?
12. Do you think this form of consumer's rights protection should be known by the general public?
13. What would, in your opinion, be the best way to raise awareness regarding hallmarks and Contrastaria's mission?
14. What would, in your opinion, be the best way to follow Contrastaria's most recent news? (ex: website, social media, newsletter)

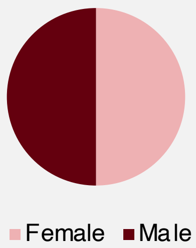
SAMPLE CHARACTERISTICS

Total Number of Individuals Interviewed

10

Interviewees

Gender Distribution



Age Distribution

Gender	Age
Female	22
	22
	40
	46
	48
Male	21
	22
	50
	52
	55

Source: Interviews

APPENDIX INDEX

Communication Strategy In-depth Survey

CONTRASTARIA

E.13. Appendix I Communication Strategy In-depth Survey (I/V)

The second survey targeting consumers had as main objective understanding the opinion of the general population regarding different means of communicating the concept of hallmarks and Contrastaria's mission. Consumers were asked to rate each communication form in terms of its effectiveness.

QUESTIONS OVERVIEW

1. General Questions

1. Age
2. Gender
3. Occupation
4. Do you purchase gold/silver jewellery items or have in the past?

2. Communication Strategy

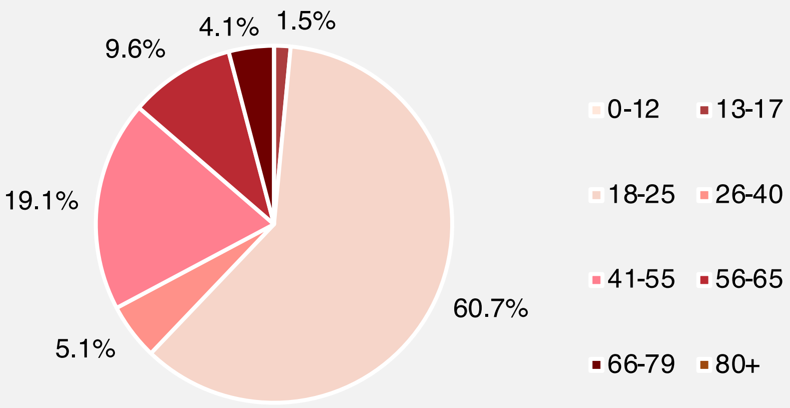
1. Please rate the effectiveness of providing a flyer during the physical purchasing to raise awareness about hallmarks and Contrastaria's mission
2. Please rate the effectiveness of providing a business during the physical purchasing to raise awareness about hallmarks and Contrastaria's mission
3. Please rate the effectiveness of using social media advertising to raise awareness about hallmarks and Contrastaria's mission
4. Please rate the effectiveness of using social media advertising to raise awareness about hallmarks and Contrastaria's mission
5. Which of these three social media advertising forms is more effective to raise awareness about hallmarks and Contrastaria's mission?
6. Please rate the effectiveness of mentioning Contrastaria on the websites of jewellery stores to raise awareness about hallmarks and Contrastaria's mission
7. Which of these three social media advertising forms is more effective to raise awareness about hallmarks and Contrastaria's mission?
8. Please rate the effectiveness of mentioning Contrastaria on physical newspaper to raise awareness about hallmarks and Contrastaria's mission
9. Please rate the effectiveness of mentioning Contrastaria on a TV report to raise awareness about hallmarks and Contrastaria's mission
10. Please rate the effectiveness of mentioning Contrastaria on a TV commercial to raise awareness about hallmarks and Contrastaria's mission
11. Do you have any other comment or suggestion regarding the communication prototypes presented?
12. Can you think of any other forms to raise awareness about hallmarks and Contrastaria's mission that were not mentioned?

Source: Team based

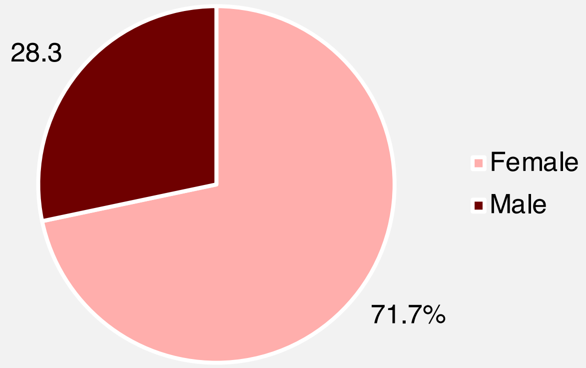
Communication Strategy In-depth Survey

E.13. Appendix I Communication Strategy In-depth Survey (1. General Questions) (II/V)

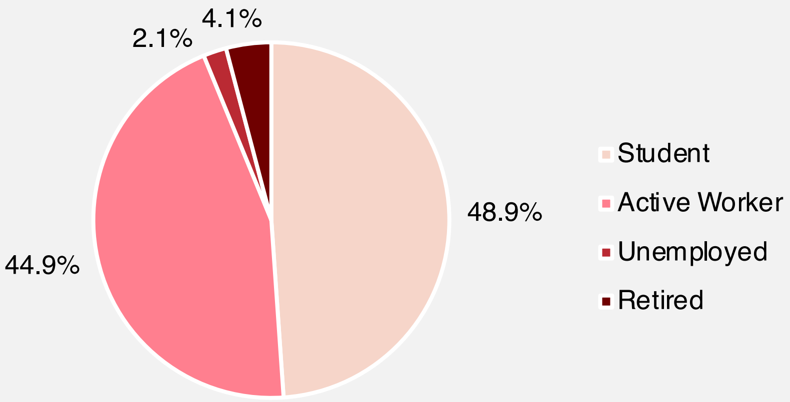
Question 1 – Age group



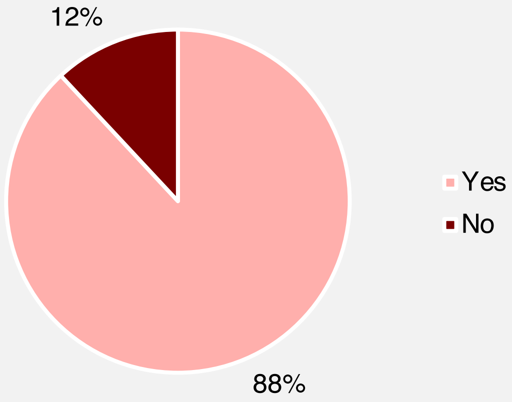
Question 2 – Gender



Question 3 – Occupation



Question 4 – Do you purchase gold/silver jewellery items or have in the past?

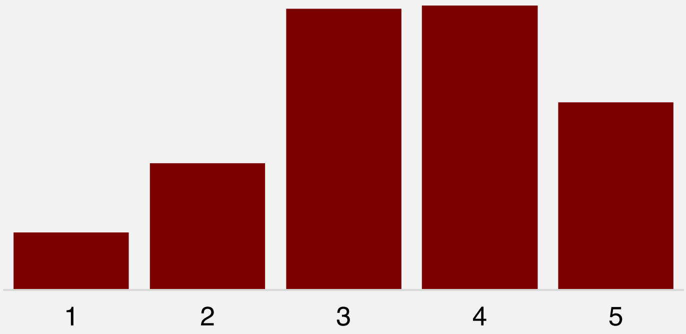


Source: Survey

Communication Strategy In-depth Survey

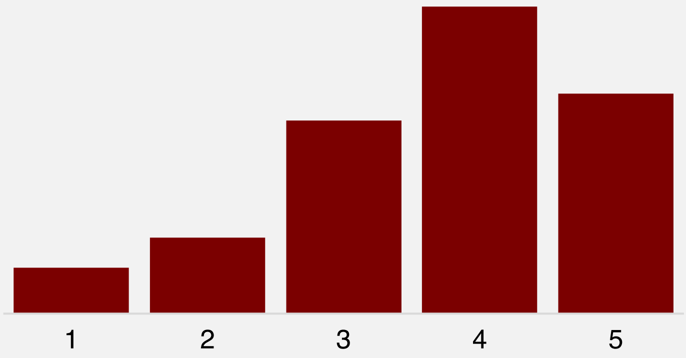
E.13. Appendix I Communication Strategy In-depth Survey (2. Communication Strategy) (III/V)

Question 1 – Please rate the effectiveness of providing a flyer during the physical purchasing to raise awareness about hallmarks and Contrastaria's mission



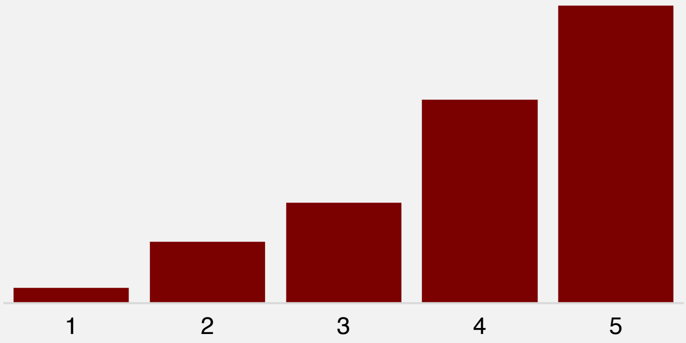
Legend:
1 – not effective at all
2 – not very effective
3 – neutral
4 – effective
5 – very effective

Question 2 – Please rate the effectiveness of providing a business during the physical purchasing to raise awareness about hallmarks and Contrastaria's mission



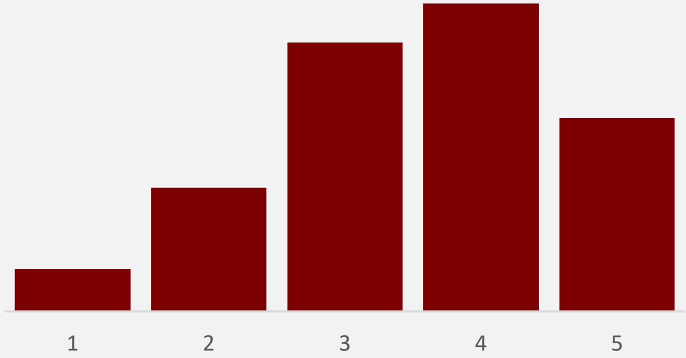
Legend:
1 – not effective at all
2 – not very effective
3 – neutral
4 – effective
5 – very effective

Question 3 – Please rate the effectiveness of using social media advertising to raise awareness about hallmarks and Contrastaria's mission



Legend:
1 – not effective at all
2 – not very effective
3 – neutral
4 – effective
5 – very effective

Question 4 – Please rate the effectiveness of using social media advertising to raise awareness about hallmarks and Contrastaria's mission



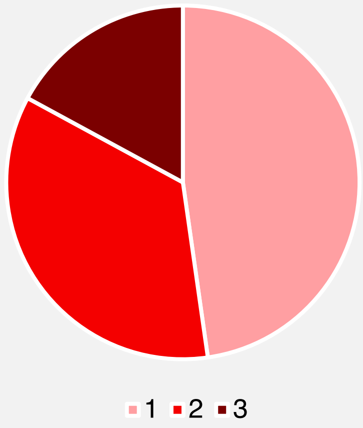
Legend:
1 – not effective at all
2 – not very effective
3 – neutral
4 – effective
5 – very effective

Source: Survey

Communication Strategy In-depth Survey

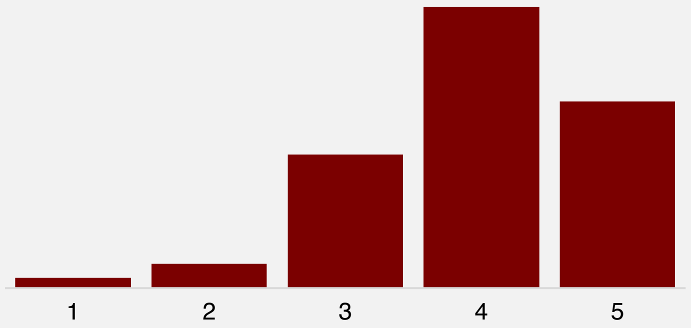
E.13. Appendix I Communication Strategy In-depth Survey (2. Communication Strategy) (IV/V)

Question 5 – Which of these three social media advertising forms is more effective to raise awareness about hallmarks and Contrastaria's mission?



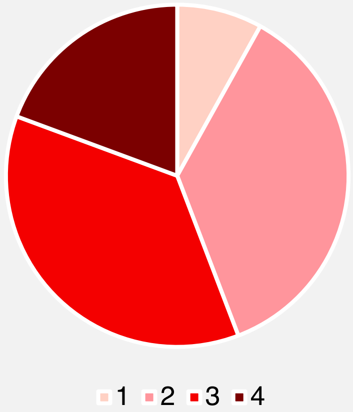
1 – Paid Instagram story
2 – Paid post on Instagram
3 – Paid post on Facebook

Question 6 – Please rate the effectiveness of mentioning Contrastaria on the websites of jewellery stores to raise awareness about hallmarks and Contrastaria's mission



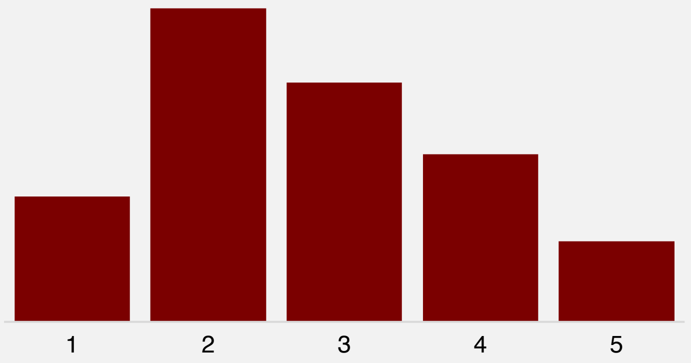
Legend:
1 – not effective at all
2 – not very effective
3 – neutral
4 – effective
5 – very effective

Question 7 – Which of these three social media advertising forms is more effective to raise awareness about hallmarks and Contrastaria's mission?



1 – Introduction of Contrastaria's logo on the bottom of the website
2 – Mentioning that the product is hallmarked by Contrastaria in the product description
3 – Introduction of the logo in the bottom right corner of the product image
4 – Creating a separate tab to inform the consumer about hallmarks and Contrastaria

Question 8 – Please rate the effectiveness of mentioning Contrastaria on physical newspaper to raise awareness about hallmarks and Contrastaria's mission



Legend:
1 – not effective at all
2 – not very effective
3 – neutral
4 – effective
5 – very effective

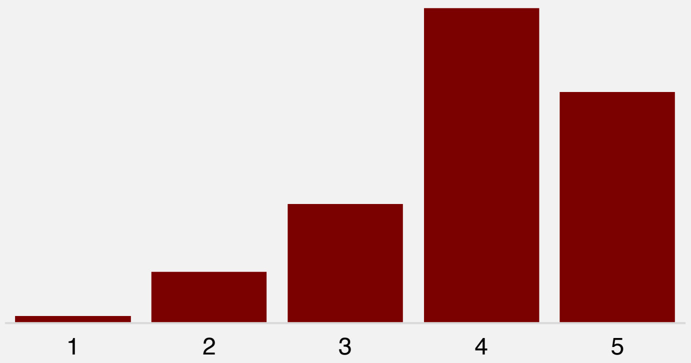
Source: Survey

Communication Strategy In-depth Survey

CONTRASTARIA

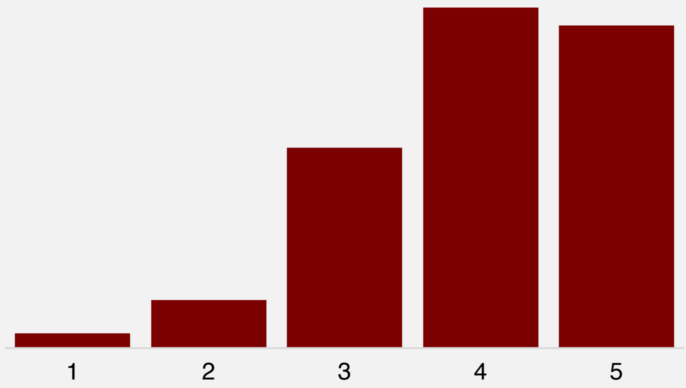
E.13. Appendix I Communication Strategy In-depth Survey (2. Communication Strategy) (V/V)

Question 9 – Please rate the effectiveness of mentioning Contrastaria on a TV report to raise awareness about hallmarks and Contrastaria's mission



Legend:
1 – not effective at all
2 – not very effective
3 – neutral
4 – effective
5 – very effective

Question 10 – Please rate the effectiveness of mentioning Contrastaria on a TV commercial to raise awareness about hallmarks and Contrastaria's mission



Legend:
1 – not effective at all
2 – not very effective
3 – neutral
4 – effective
5 – very effective

Question 11 – Do you have any other comment or suggestion regarding the communication prototypes presented?

"*Digital and physical certificate with a photo of the product as well as its specifications*

The most effective means of communication is a TV report or a physical newspaper as these are seen as more trustworthy

Nowadays most people don't read flyers, they go directly to the trash

I believe that a commercial broadcasted during the news is the most effective way of communication. It is a great way to teach the consumer how to check the hallmarks during the purchasing act

I believe that most effectiveness can be achieved by communication during the purchasing act"

Question 12 – Can you think of any other forms to raise awareness about hallmarks and Contrastaria's mission that were not mentioned?

- Proof of certification in shop Windows
- Small cards with the product package
- Competent influencers
- Briefing provided by jewellers
- Email marketing
- Mupis
- Youtube videos

Source: Survey

APPENDIX INDEX

Economic Operators' Interviews

E.14. Appendix I Economic Operators' Interviews

ECONOMIC OPERATORS' IN-DEPTH INTERVIEWS SCRIPT

General Question

1. What is your business title?

Feedback Strategy

1. How would you define your relationship with Contrastaria?
2. Do you think Contrastaria is a present and proactive figure in the industry?
3. Do you think Contrastaria is recognized by the general public in Portugal?
4. Do you usually provide feedback to Contrastaria?
    1. In case the interviewee does not: Why not?
5. Do you think the means to provide feedback are not efficient?
6. How would you like to offer feedback to Contrastaria regarding the services provided?
7. If it would be possible to provide feedback through Contrastaria's website would you be willing to use that platform?
    1. In case the interviewee does not: Why not?

Promotion Strategy

1. Do you think hallmarks entail benefits? Why?
2. In your Marketplace do you mention hallmarks or Contrastaria as well their importance?
3. Would you be willing to use the following methods?
    1. Online Store:
        a. Website
    2. Physical Store:
        a. Flyers
        b. Cards
        c. Price tags
4. Regarding the reference on your website: what option would you be most willing to integrate?
    1. Option 1 – Introduction of Contrastaria's logo on the bottom section of the website
    2. Option 2 – Mentioning that the product is certified by Contrastaria in the product composition section
    3. Option 3 – Introduction of Contrastaria's logo on the bottom right corner of the image of each product
    4. Option 4 – Creating a separate tab on the website with information about hallmarks and Contrastaria

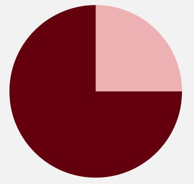
SAMPLE CHARACTERISTICS

Total Number of Individuals Interviewed

8

Interviewees

Gender Distribution



Distribution by Location

Location	Total
Lisbon	5
Porto	1
Póvoa de Varzim	1
Tavira	1

Source: Team based, Interviews

APPENDIX INDEX

Assay Assured Specifications

CONTRASTARIA

E.15. Appendix I Assay Assured Specifications (I/II)

ASSAY ASSURED

- Shares a list of retailers that meet the imposed requirements

Process

- To be eligible, retailers **must meet legal requirements** and pay the annual membership fee which starts at £125 per year
- After the retailer's application, **an Assay Assured audit is performed to validate the deal.** Upon validation and inclusion of imposed recommendations, retailers will receive the Trustmark and certificate

Defaults

- Sharing the code of conduct that retailers must abide by
- **Consumers will be able to report if there is any suspicion of non-compliance**

ASSAY ASSURED JEWELLERY RETAILER

- Brand present on the websites of some participating retailers
- When visitors click on the logo, it directs them to the certificate issued by Assay Assured

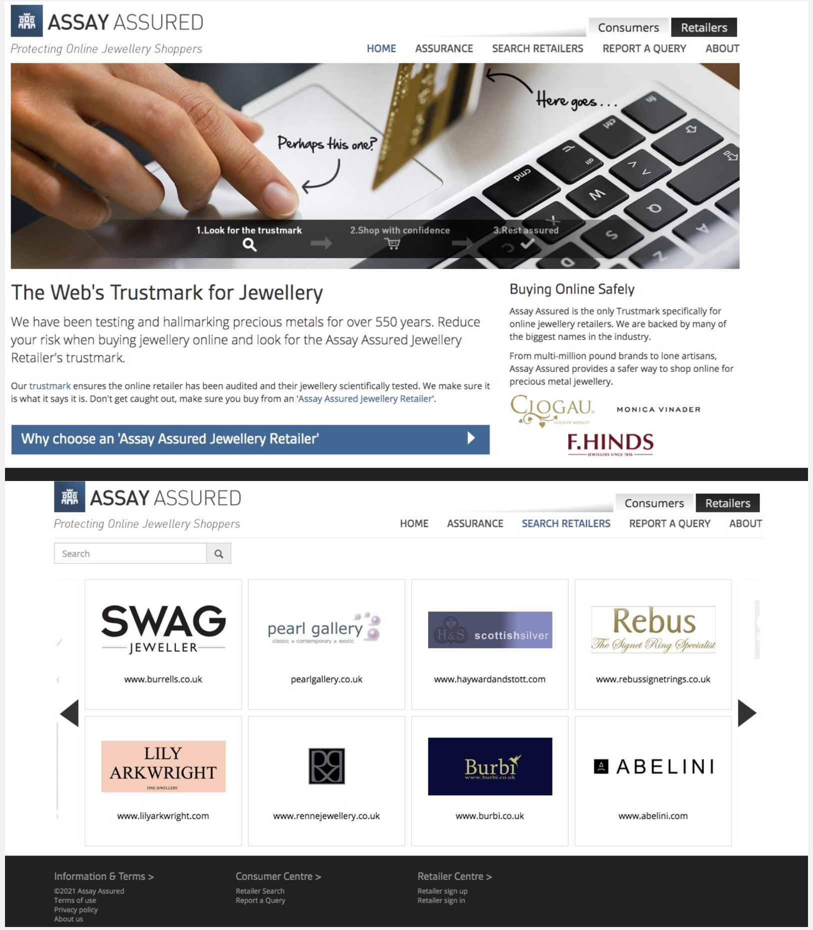
Steps to verify the Trustmark

1. Check the Trustmark on the retailer's website
2. Click on the Trustmark and check the link associated with the certificate
3. Check that the retailers' information corresponds to what is stated in the certificate

KEY TAKEAWAYS

- The use of a digital certification **allows the consumer to be given a key element of trust**
- This certificate delivers **security, reliability and authenticity** to the market
- In order to be admitted to Assay Assured, retailers **are required to comply with certain legal requirements.** These are then audited for business validation
- **If there is any suspicion of non-compliance with the standards**, **consumers can report the situation**

DIGITAL CERTIFICATION

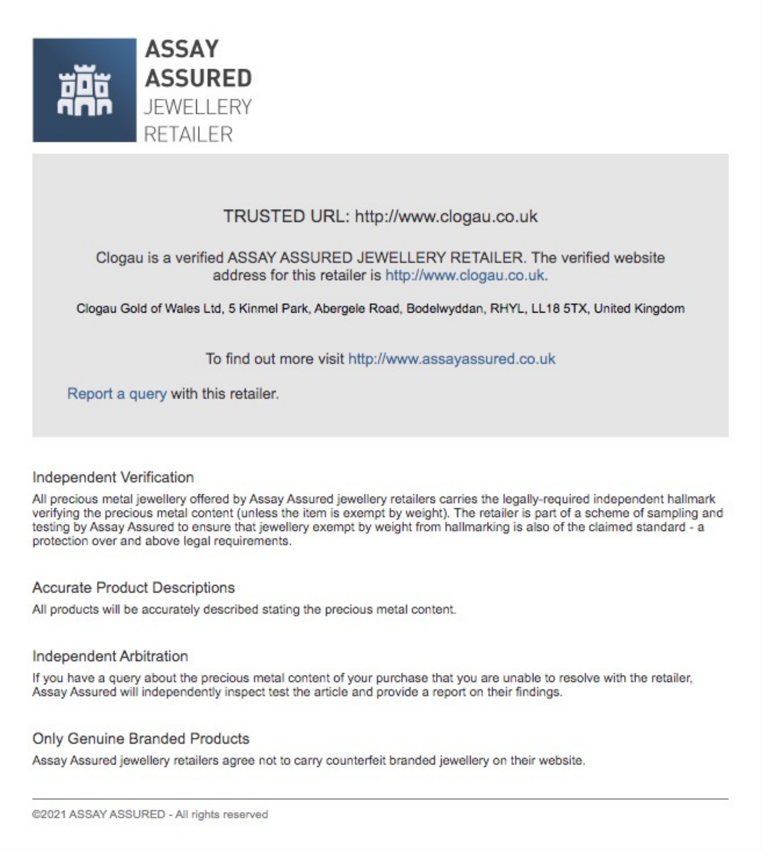


Assay Assured Specifications

CONTRASTARIA

E.15. Appendix I Assay Assured Specifications (II/II)

ASSAY ASSURED



ASSAY ASSURED JEWELLERY RETAILER

TRUSTED URL: http://www.clogau.co.uk

Clogau is a verified ASSAY ASSURED JEWELLERY RETAILER. The verified website address for this retailer is http://www.clogau.co.uk.

Clogau Gold of Wales Ltd, 5 Kinmel Park, Abergele Road, Bodelwyddan, RHYL, LL18 5TX, United Kingdom

To find out more visit http://www.assayassured.co.uk

Report a query with this retailer.

Independent Verification

All precious metal jewellery offered by Assay Assured jewellery retailers carries the legally-required independent hallmark verifying the precious metal content (unless the item is exempt by weight). The retailer is part of a scheme of sampling and testing by Assay Assured to ensure that jewellery exempt by weight from hallmarking is also of the claimed standard - a protection over and above legal requirements.

Accurate Product Descriptions

All products will be accurately described stating the precious metal content.

Independent Arbitration

If you have a query about the precious metal content of your purchase that you are unable to resolve with the retailer, Assay Assured will independently inspect test the article and provide a report on their findings.

Only Genuine Branded Products

Assay Assured jewellery retailers agree not to carry counterfeit branded jewellery on their website.

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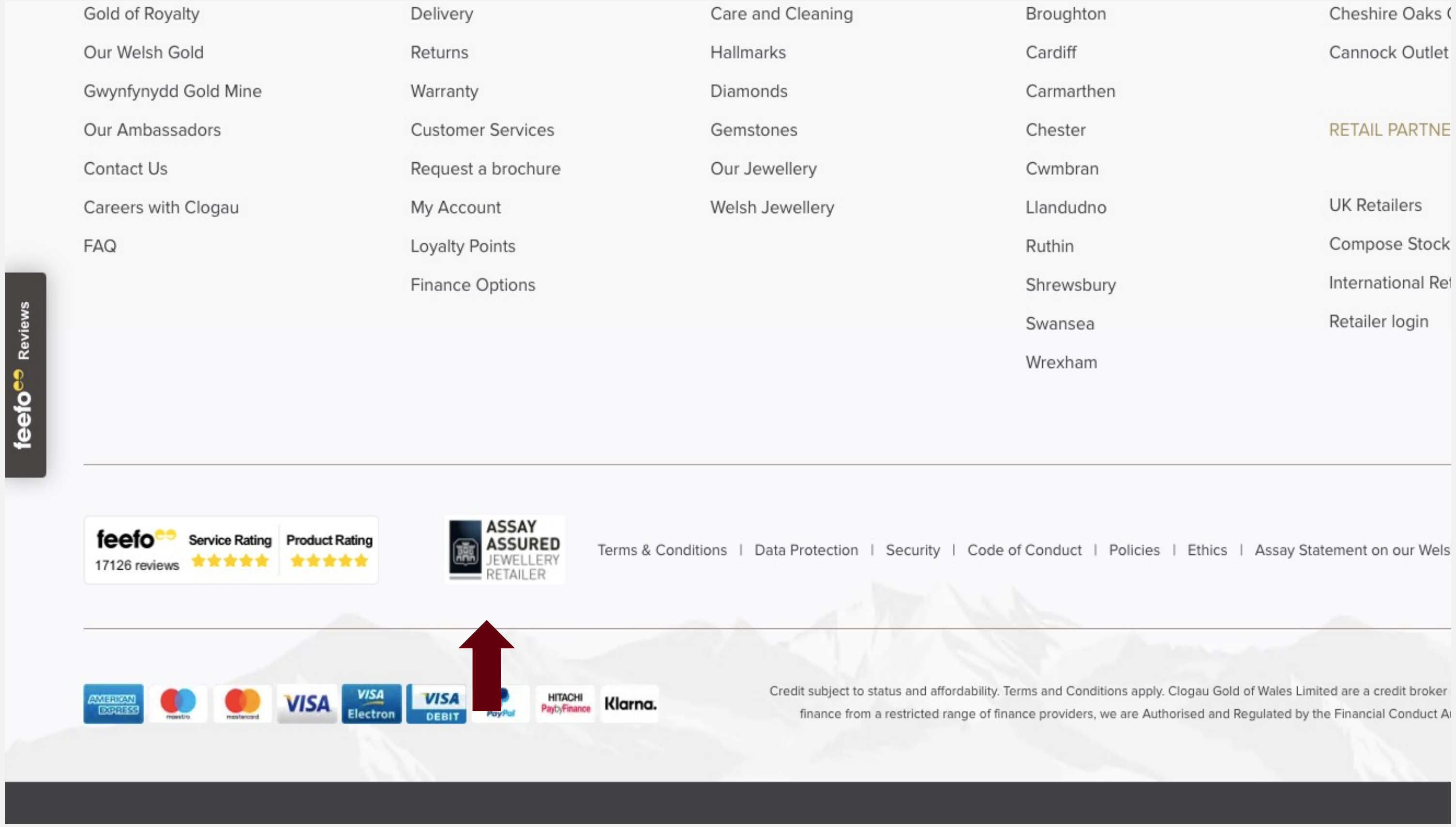

- The first image presented represents the certificate issued that reveals the data of the economic operator in question, certifying its brand as an example of security, trust and reliability, fulfilling all legal duties
- As for the second image, as a digital certification, Assay Assured allows the placement of the seal on websites, guaranteeing, once again, to the consumer, a safe purchase act

Source: Assay Assured (2021)

APPENDIX INDEX

CONTRASTARIA

Detailed KPIs

E.16. Appendix I Detailed KPIs

DETAILED KPIs

Number of Impressions: refer to the number of times your ad or content has been displayed on a screen. Impressions are calculated by:

$$\text{Impressions} = \text{Spots} \ * \text{Average Persons}$$

- **Spots**: A Spot is a single broadcast of an advertisement. Typically, an advertising placement includes multiple spots
- **Average Persons**: Average Persons is the number of people that, on average, will be exposed to each Spot. Average Persons is calculated by:

$$\text{Average Persons} = \text{Population} \ * \text{Rating}$$

- **Population**: Population is the total number of people in your Media Market.
- **Rating**: Rating is the percentage of the people in the Social Network that will likely be exposed to your advertisement. Rating is an estimate based on past performance often sourced from surveys

Audience Growth Rate: measures the speed at which your brand's audience (followers) increases on social media

$$\text{Audience Growth Rate} = \frac{New\ Followers}{Total\ Audience} * 100$$

Average Engagement Rate: measures the amount of interaction one's content earns relative to reach or other audience figures. This can include reactions, likes, comments, shares, saves, direct messages, mentions, click-throughs and more (depending on the social network). Average Engagement Rate is calculated by:

$$\text{Average Engagement Rate} = \frac{Total\ Engagement}{Total\ Followers} * 100$$

- **Total Engagement:** number of interactions (the measurement of which is dependent on the platform, can be likes, followers, shares,...)
- **Total Followers**: total amount of individuals that are following the account or page

Source: Pych (2017), Corporate Finance Institute (2021), Shleyner (2021)