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Virtual Communities in E-Commerce: The Case of Etsy Forums.

Author: Edouard J. Hemsted, 579369

eddiehem96@gmail.com

Supervisor: Dr. Christian CW. Handke

handke@eshcc.eur.nl

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ABSTRACT:

The cultural and creative industries are undergoing profound changes in the digital age. As the web 2.0 has given anyone the chance to share content online, a number of platforms have established themselves as intermediaries between potential cultural entrepreneurs and their audience. Although it is unclear if digital platforms for cultural and creative goods improve seller opportunities, their users congregate within them and ideas are shared, feedback is given, opinions are stated, tips are exchanged, and help is requested. This group of loosely connected individuals is united by a common interest which materialises on the platform, forming what is known as a virtual community. Discussions are generated within these online platforms. As help is given and recommendations are exchanged, knowledge collaboration takes place. Moreover, members of these virtual communities generate electronic word of mouth which reveals user preferences, perceptions and opportunities to improve the platform.

This paper focusses on the online communities which have formed around an e-commerce platform for self-produced creative goods: Etsy. As well as giving sellers the opportunity to sell their artisanal goods to a wide pool of potential customers, it gives them the possibility to interact with one another in a selection of dedicated forums which cover a range of topics. The objectives of this study are threefold. Firstly, by seeking to outline how the interactions made by sellers in Etsy forums change from one given forum to another, it will be understood how different virtual communities form in relation to the topic addressed in the discussion board. Secondly, by harnessing the electronic word of mouth generated by users in the form of posts and the engagement metrics from answering sellers, the different perceptions and needs of Etsy sellers will be illustrated along with the preferences of those who participate in the forums. Finally, investigating the relationship between seller characteristics and their interactions on Etsy will determine how differing users engage with distinct forums, topics and sentiments. The intention is not only to outline how the virtual communities present in e-commerce platforms can be studied, but also how these may change between different discussion boards, how they reveal a distinct organisation, set of priorities, and needs. Added with the fact that participation in a given forum, topic or even interacting in a certain sentiment reflects a set of common user characteristics.

To achieve this, one hundred entries were sampled across two forums which embody two distinct purposes: "Marketing Your Business" which is sales and marketing oriented and "Creative Process" which is focussed on artisanal production and the Etsy creative community. Results indicate divergence in overall sentiment and topics between both forums, with differing rates of engagement. Both discussion boards are shown to have their own specific interaction mechanisms and reveal diverging seller needs, preferences and priorities. Finally, a clear connection is drawn between seller characteristics and the type of forum that is consulted, along with the topic that is addressed, although less so with post sentiment. The method chosen for this inquiry is mainly comparative, although the final section of this paper engages in a cross-sectional analysis covering the whole sample.

Keywords: Virtual Communities, Electronic Word of Mouth, Social Commerce, Knowledge Collaboration, Interactions, Seller Characteristics.

Table of Contents

1) Introduction.....	5
2) Theory.....	8
A. Conceptual Framework.....	8
I. Virtual Communities	8
II. Interaction and Engagement.....	9
III. Community Solidarity.....	10
IV. Seller Characteristics.....	10
B. Theoretical Framework	11
I. Social Commerce Systems.....	11
II. Electronic Word of Mouth	12
III. Relating Seller Characteristics to Forum Interactions.....	12
3) Methodology	14
A. Data Collection	15
B. Content and Sentiment Analysis	16
I. Content Analysis	18
II. Sentiment Analysis.....	20
C. Research Process.....	23
4) Results	25
A. User Engagement and Interactions.....	25
I. Content Analysis	25
II. Sentiment Analysis.....	27
III. Sentiment in Relation to Post Complexity	30
IV. Forum Post Topics, Likes and Replies.....	30

B. Topics Shown to be Important to Etsy Sellers from Forum Activity.....	33
I. Topic Main Categories.....	33
II. Sentiment and Complexity: Answering Sellers	37
C. Seller Characteristics in Relation to Interactions	40
I. Type of Forum Solicited	40
II. Topics in Relation to Seller and Shop Characteristics	42
III. Sentiment in Relation to Seller and Shop Characteristics	44
5) Conclusion, Implications and Limitations.....	46
A. Conclusion	46
B. Implications.....	48
A. Limitations	49
6) Bibliography	50
5) Appendix	53

1) INTRODUCTION

Over the past decades, cultural and creative industries have seen themselves fundamentally reshaped by the digitization of their intermediaries. As marketplaces for physical goods have moved online, value chains have been profoundly disrupted, resulting in a shift in production, distribution, and consumption practices (Bacache-Beauvallet and Bourreau, 2020). A paradigm shift that is embodied by the rise of various digital platforms which have greatly facilitated transactions between buyer and seller for a plethora of goods and services. It has been theorized that newcomers seeking to enter markets now face lower barriers to entry than prior to this phenomenon, that those who would previously fail to emerge can now reach their audience with greater ease. Because physical constraints are removed, whilst both consumer search and producer distribution costs are lowered, markets are said to be rendered more efficient by e-commerce platforms. As goods and services are bought over the internet, producers can supply a greater diversity of products at a lower cost and financial risk. With an abundance of pre-purchase information provided online, consumers can also search for specific products that suit their personal preferences, (Handke, Stepan and Towse, 2014). The idea that digital marketplaces opened opportunities for novel and niche goods is not new (Anderson, 2004, 2006), it is however a debated topic. In spite of the fact that the market share for such products has increased, revenues in the cultural and creative industries are still highly unequal in their distribution (Epstein, 2017). But it is undeniable that such process innovations have greatly altered retailing and distribution practices, most notably through the fact that independent producers can admittedly service a greater market than ever before and that the whole sales process between buyer and seller has become digitalised, also allowing peer-to-peer relationships to flourish on their premises.

The topic covered by this thesis in Cultural Economics and Entrepreneurship concerns digital platforms. Sellers on the e-commerce platform for self-produced goods named Etsy have been chosen as research subjects. Founded in 2005, it is the leading e-commerce platform that allows users to sell self-produced crafts and vintage goods. Sellers list their products for a small fee and customers browse, select and purchase their goods directly off the site. Etsy therefore acts as an online intermediary between buyer and seller. It has grown to become the leader of its kind, connecting over 4 million sellers with close to 82 million buyers (Etsy Annual Report, 2020). The website clearly states its goal as supporting independent creators, hence an ethos that seeks to inspire prospective sellers to follow their intrinsic motivations and start producing and disseminating self-produced craft goods. With dedicated blogs titled “Quit Your Day Job”, Etsy clearly wants to make it seem like anybody can take advantage of the “Long Tail” and make a living from self-produced goods. However, the reality is that a very small percentage of sellers on the platform make a full time living (Blanchflower and Hodges, 2015). It has been argued that e-commerce is associated with even greater competition and that digital retailing is even more concentrated online, also that the power of such platforms on online visibility may raise barriers to success (Bacache-Beauvallet and Bourreau, 2020). It has also been argued that sellers are precariously dependent on the platforms rating and recommendation systems (Cutolo and Kenney, 2019). The marketing strategy put forth by the company about quitting one’s day job to engage in full time production and sales has been qualified as misleading (Krugh, 2016). In 2015, 30% of sellers used Etsy as their sole occupation and it has been asserted that many sellers have difficulties finding financial independence through Etsy.

Despite the fact that Etsy does not fully improve opportunities to become a fulltime independent professional, it is among the new tools of production and dissemination that have completely changed sales and consumption practices (Mangematin, Sapsed and Schüssler, 2014). Marketplace digitization is

the underlying mechanism behind the increased market share of niche products. The processes of disassembly and reassembly are mentioned, with the first being the reshaping of business models through new transaction and distribution processes and the second refers to new tools to interact with consumers and other producers. Overall, both new opportunities and challenges arise through this transformation in which technology is mobilized to address new consumer practices, challenging prevailing logics in the process (Teece, 2010). Thus, new sectors such as e-commerce for the creative and cultural industries demand new capabilities which fuse technical and analytical skills with creativity. As a result of this phenomena, new social interaction systems emerge for these niche goods and practices. A community of sellers emerges in the premise of Etsy, which takes on properties of a social network. Interactions are made online about sales and creativity. With community posts uniting sellers and enticing them to participate in various threads.

Etsy is above all a two-sided platform; it facilitates the interactions and transactions between buyers and sellers. However, for this to take place, it is primordial that both sides of the market are stimulated to consume its services. As it has been shown that the value a seller derives from a platform is dependent on the number of active customers, an ecosystem of users needs to be built to generate network effects (Glimstedt, 2018). If more sellers join Etsy and offer a greater diversity of products, this will entice a larger quantity of buyers and increase their sales opportunities in return. This is known as direct network effects, consumer benefits which build themselves directly on the number of users. Forums are integrated onto Etsy with this intention: to create an ecosystem of sellers which mutually benefit and entice one another to sell on the platform. As sellers become engaged on the discussion boards, they help others establish themselves, create a sense of belonging for them and give a range of advice, assisting in the maintenance and expansion of the Etsy seller community. These forums are therefore catalysts for network effects, using its users as complementors which offer free advice to new users, lowering their product uncertainty relative to the platform in the process. Additionally, research has shown that the emergence of customer entrepreneurs has reshaped the practices, beliefs and values held by organizations, otherwise known as institutional logics, (Park, Ritala and Velu, 2021). Because customers satisfaction dependent on the quantity and quality of registered sellers, it is necessary for an organization like Etsy open communication channels in order to develop intra-organizational relationships. Forums therefore play a dual role for Etsy as they amplify seller induced network effects and foster interdependent relationships between sellers and the digital platform, yielding a range of usable data to study their profile, needs and activity on the site in the process.

Social media components are therefore fostered in order to enable B2B relationships that form a marketplace around a particular good and fosters a community with a shared interest in its production and sale (Blanchflower and Hodges, 2015). The strength of this community is illustrated by the sharing of trade secrets between competitors surrounding marketing practices and is qualified as a collaborative environment between users rather than competitive. However, a further study has shown that motivational differences between sellers influence which types of advice and support are valued and which will be provided (Kuhn and Galloway, 2013). Motivations determine the type of interactions that users have on the platform. Moreover, a further cross-sectional analysis qualifies this practice as “network membership”, it is presented as one of four value drivers for a successful P2P business on Etsy (Chandah and Salimath, 2018). This paper seeks to study how this “network membership” functions on Etsy. As the Etsy community may flourish in the forums, they also allow what will be defined as “information collaboration” (Faraj, Jarvenpaa and Majchzark, 2011). Two different forums have been chosen as subjects of a comparative analysis which seeks to highlight how engagement and interactions change online

between dedicated Etsy discussion boards. These forums represent two different aims. The first one, “Marketing Your Business” is orientated to help users achieve more sales and market their business more effectively, whilst the second is named “Creative Process” which is intended for users to exchange creative ideas and production tips. These are clearly two different goals and general topics for sellers to participate in. This study has sampled a hundred posts from each forum, along with a selection of further variables extracted from the user’s profile and shop page on Etsy. The sampled posts and Etsy sellers will be used to answer the following three research questions.

RQ1: How does seller engagement and interaction vary between different Etsy forums?

RQ2: What is shown to be important to Etsy sellers by their activity on online forums?

RQ3: A- How do seller characteristics determine the type of forum they solicit?

B- How do seller characteristics determine the type of interactions they make?

This study investigates how the posts in each forum elicit distinct interactions and rates of engagement, using manually mined data, extracted straight from the forums themselves and subjected to a sentiment and content analysis. Numerical values surrounding the seller, his shop and his activity on Etsy have also been manually scraped with the accompanying post. Post replies and likes from other members of the community will also be used as an engagement metric. Research is mainly comprised of a comparative analysis between both forums, which elucidates how “network membership” shifts between forums, how these differences reveal preferences and needs among users and how different seller characteristics influence the type of forum which is consulted. For the final section of this research, a comprehensive cross-sectional analysis is undergone to assess the relational significance between Etsy seller characteristics and the type of interactions made.

Results indicate differing rates of engagement between forums, with the content analysis revealing both continuities and differences in post interactions and divergences in post complexity. The sentiment analysis determines clear differences in interactions between both forums, with the sales orientated “Marketing Your Business” containing more negative entries than the creativity focussed “Creative Process”. Topics are also qualitatively assigned to reflect how each discussion board reflects different objectives, which arouses differing interactions among its users. Moreover, these topics are examined in relation the engagement rates they capture in each forum, highlighting the differing preferences of answering sellers in each forum. Sentiment is then used in relation to the topic to investigate what sellers talk about in the most positive and negative manner on the forums, reflecting diverging needs and preferences between discussion boards. Finally, seller characteristics are used to establish what type of users consult a particular forum, what topics a given user talks about and if there is a relationship between the sentiment expressed in posts and the seller’s characteristics. Findings reveal different seller attributes between both sampled forums, that certain topics are addressed by newer users, whilst others are covered by sellers which tend to have a more developed shop in terms of sales, items and following. Although a concrete relationship between sentiment and seller characteristics could not be fully established, insights still pertain over possible connections between sentiment and user features.

This paper starts by defining key concepts and then the underlying theoretical framework necessary to contextualise each research question. Next, the methodology section will outline the data collection process and exploitation. This will be accompanied by an extensive results section before concluding with key takeaways, study implications and research limitations.

2) THEORY

A. Conceptual Framework

I. Virtual Communities

When studying seller interactions in e-commerce platforms such as Etsy, forums group users together in relation to various topics which correspond to their activity on the website. Online bulletin boards host groups of individuals interacting online and form what is described as an “online” or “virtual” community. For commercial organisations, these are essential for building and maintaining relationships between their brand and consumers, reflecting their perceptions and potential areas where improvement is required, (McWilliam, 2000). Additionally, an abundance of user generated content is freely created by likeminded consumers where relationships are formed, drawing users towards the brand on a continuous basis. Hence, online forums are deployed by a large number of enterprises as a multifunctional marketing tool. However, their intention is not only to benefit the company itself, but also consumers, as information and ideas are shared between users of the forum in a non-rival manner, increasing transparency and lowering uncertainty in relation to the purchased product. This is known as knowledge collaboration, where users can exchange insights that will benefit them personally, (Faraj, Jarvenpaa and Majchzark, 2011). Despite being referred to as sellers, users of Etsy forums are also consumers, as they are engaged with a brand and product which is an online retailing platform for vintage and self-produced goods. The information exchanged in discussion boards takes on public good properties and this directly fosters knowledge spillovers as sellers freely circulate their expertise between themselves. These two components are central issues in this study as the content of two Etsy forums will be analysed in relation to both of these dimensions, with the ambition of answering how different forums create distinct online communities where different forms of knowledge exchange takes place and different consumer needs are highlighted.

Past research has examined the factors influencing knowledge collaboration in online communities. A study conducted by Pi, Chou and Liao (2013) analysed the motivations of users sharing ideas in Facebook groups, using questionnaires and partial least square regressions to test a range of hypotheses formulated around this topic. Results indicated that a sharing culture was the most influential factor behind information exchange, corresponding to users interacting fairly without animosity, identifying themselves to one another and creating an open environment for interactions. A further study by Preece (2001), proposed a framework for determining and evaluating the success of online communities which consisted of two main categories: “sociability” and “usability”. The first term is relative to “knowledge collaboration” and is deconstructed into three components: a general “purpose” or common group focus, “individuals” which fuel the discussion board, fulfilling different roles by giving and asking for information and “policies”, a mutually understood code of conduct which creates a cohesive environment, guiding contributions and providing community governance. Whilst the second category refers to the discussion boards accessibility and ease of use in terms of design, navigation, interaction and access, a study conducted on online community members in South Korea using a questionnaire based on the aforementioned framework revealed users to consider the “sociability” aspect to be more important than the latter (Kim, Park and Yin, 2008). Although this study will not be an evaluation of the different virtual communities present in distinct Etsy forums, it is important to outline their determinants through the “sociability” category. As these present the general functioning of an online community and its knowledge sharing processes, as well as the determinants of user-to-user interactions.

II. Interaction and Engagement

In order to conduct a comparative study of two different online forums on Etsy, posts submitted by sellers on the platform are to be used as main units of this analysis, as they define how interactions and participation may change from one discussion board to another. The former refers to direct involvement or communication with a given forum by a posting Etsy seller, whilst the latter, otherwise known as engagement, is the action of taking part in the given forum or post. Participation levels in online forums can be measured quantitatively, it is however essential to establish which indicators it is defined by. For example, in a study of student engagement on learning management systems, (Beer, Clark and Jones, 2010), indicators taken from academic analytics such as the average page visits per user or time spent on site per user were used to quantify participation levels. Furthermore, a marketing paper published by Haven (2007), defines online brand engagement metrics into four components, notably “involvement” with metrics as described above, with site clicks, average visits and time spent, “interaction” which is the contribution to blogs and forums, “intimacy”, defined by sentiment analysis and finally “influence”, concerning brand presence and electronic word of mouth. As this study focusses on online communities developing in an e-commerce platform for self-produced goods and not a given consumer product, this paper will use the first three of the four proposed components, with engagement strictly referring to the “Involvement” category. The second component, “Interactions” have been qualitatively analysed in past research, notably by sorting posts into different topic categories, (Burri, Baujard and Etter, 2006; Hanna and Gough, 2016). Two different means for post analysis are therefore presented as engagement and interaction. However, basing interaction purely off topic categories is a very limited form of analysis. Hence, the need for a more detailed post analysis which can also cover “intimacy” through sentiment analysis.

In order to obtain deeper insights about how interactions are made by Etsy sellers on dedicated forums, a sentiment analysis is to be conducted for each sampled post in order to illustrate how attitudes may differ between forums, topics and posting sellers. Defined as the process of revealing the opinion or sentiment of a certain body of text (Feldman, 2013), it can be categorized into two different methods: emotion detection, where sentences are classified amongst different sentiments and polarity analysis, a binary approach which sorts them between positive and negative, (Naldi, 2019). The latter is also referred to as “opinion mining” by past research, notably in a study by Kaiser and Bodendorf (2009) which used this process to manually detect the attitudes of users towards a given product by studying over 900 forum postings about it. The polarity sentiment analysis stands as a valid method for studying interactions on online discussion boards. However, components of emotion detection can also be included in a further content analysis, which can sort form posts according to different categories, such as in a study undertaken to classify user posts in a given online forum into eight classifications, with two of them being emotive in nature (Bhatia, Biyani and Mitra, 2012). A content analysis seeks to define the role or functions different posts in a forum may fulfil, sorting them into different categories as described. The study conducted by Finegold and Cooke (2006), deployed an elaborate content analysis on entries in a university forum, assigning each sentence with one of 24 different categories to define the functions each post held. Whilst the majority of these were purely functional in nature, six of them related to emotion detection, being divided into a negative and positive binary approach. This fact is used as proof that sentiment and content analysis are often inextricably linked with one another and to justify using both a polarity sentiment analysis and a content analysis which borrows elements from the emotion detection process.

III. Community Solidarity

Furthermore, another common ground between both interaction analysis methods is signs of peer-to-peer solidarity in online forums. A study by Gritsenko (2015) on an IT support forum has shown that a set of common interaction principles are present in forums as they would be in face-to-face group interactions, that a set of norms exist alongside a group identity which stems from a common set of goals and the resulting interdependence between forum users. This is closely associated with the aforementioned factors which induce “knowledge collaboration”, create a sharing culture and influence Preece’s (2011) “sociability” category. It can therefore be assumed that certain norms pertain in the way that sellers write posts in an Etsy thesis and that these are then assimilated into the sentiment and content analysis. For example, Finegold and Cooke’s (2006) analysis has a specific category which is devoted to showing solidarity to other members of the community and classified as part of the category which covers positive emotions. This refers to individuals addressing others in a positive way, something which creates fairness, openness, and identification amongst online forum users (Pi, Chou and Liao, 2013). These can therefore be considered positive speech norms and also need to be accounted for in a polarity sentiment analysis, as positivity directed towards other users differs from positivity aimed at Etsy and its features as it is a hallmark of common norms and community solidarity online. Hence, the need for a post sentiment analysis which employs two distinct categories for both normal positivity and positive community interactions.

IV. Seller Characteristics

Finally, a further unit of analysis this paper focusses upon is the seller that is writing the posts and his attributes, otherwise referred to as seller characteristics. These can be directly obtained by accessing the seller’s profile and shop through the forum and useful insights about his experience on the site and the extent of which his shop page is developed can be obtained. A study focussing on an internet forum dedicated to the Linux operating has qualitatively assigned four different user-level attributes based on their written posts, regarding their clarity, written proficiency, tone and effort which was put into the entry (Lui and Baldwin, 2010). Another relevant paper engages in a survey of user characteristics such as demographics and registration status on an online drug forum (Chiauzzi, DasMahapatra, Lobo and Baratt, 2013). Both methods are relevant to this study as the sentiment and content analysis reflect the Etsy forum user’s way of writing posts, although not fully similar, some elements are borrowed from Lui and Baldwin’s study, notably the tone through the sentiment analysis and complexity via the content analysis, which can be equated to proficiency and effort. Etsy seller characteristics are analysed in the same manner as the study on the online drug forum, by mining user attributes directly from the forum itself. These user characteristics are the final key component to the study of Etsy forums, therefore concluding the different concepts this research paper will draw upon.

B. Theoretical Framework

I. Social Commerce Systems

Online communities for the sales platform Etsy materialise within its various forums. Also referred to as bulletin board systems, or online discussion boards, they have been shown to be a key source of data for conducting qualitative research about e-commerce for reasons such as being publicly available, unsolicited, anonymous and without any material incentive given to their users (Dholakia and Zhang, 2004). However, it is also necessary to consider the numerical engagement indicators included with each post, making them ideal subjects of analysis for a mixed methods approach. The initial aim of this study will be to see how interactions and engagement varies between two different forms on Etsy by undertaking a comparative analysis. Academic research contrasting the effectiveness of two different discussion board systems for the same university course has used the word count of each post as an indicator of participation (Harmon and Tomolonis, 2019), whilst this study will mainly focus on the level of external engagement on forum posts from other users in the form of likes and replies. Forum posts, cited as interactions and having been presented as a valid data sources, will first be classified into topic main categories. Next, once sentiment and content analyses are both conducted for the sampled entries in each forum, results will be contrasted between both forums to outline how seller interaction shifts between discussion boards that focus on distinct topics. A research process which has already been employed in the study of two different health forums covering the specific topics of doctors and drugs (Jiménez-Zafra, Martín-Valdivia, Molina-González and Ureña-López, 2019). Whilst it used a lexicon-based sentiment analysis to uncover language differences between entries this paper will compare a sentiment and complexity indicator in order to uncover possible contrasts between forums.

Moreover, discussion boards and the resulting online communities that materialise within them act as a social network of Etsy sellers. Because the platform integrates social media features it can be referred to as a social commerce. A trait mainly attributed to the consumers perspective as information can be obtained to reduce uncertainty and increase trust upon purchase. As stated previously, the seller is considered a consumer of Etsy's services, using the forums to reduce uncertainty related to site usage. In what is known as the "Social Commerce Adoption Model", this is achieved through the social support available to consumer through ratings, reviews, recommendations, referrals, and the virtual communities themselves, increasing trust in order to finalise an online purchase (Hajli, 2013). Similarities pertain to sellers on Etsy, as they also benefit from social support, which equates to knowledge collaboration. It has been demonstrated that different forms of collaborative information exist on Etsy, as some sellers seek to increase sales whilst others solicit the community in search of inspiration and information on new creative techniques (Blanchflower and Hodges, 2015). A further study by Chen, Zhu and Mantrala (2020) sought to highlight the impact different forms of peer-to-peer social support has on sales for e-commerce vendors, distinguishing between technical support and emotional support, with the first being guidance to resolve a particular problem and the second being when reassurance is given in the face of frustration or disappointment. Results showed the former as having a positive impact on sales volume whilst the second had an adverse effect, demonstrating that separate types of queries generate different outcomes. As both Etsy forums covered in this study directly refer to the two aforementioned forms of information collaboration, it is therefore understood that they will command different ramifications in terms of engagement and interactions. Each forum will illustrate the interactions behind distinct social commerce systems.

II. Electronic Word of Mouth

Furthermore, within both forums, sellers can discuss a range of topics relative to their activity on the platform and their production process. For Etsy, entries can be considered as user generated media or content, presenting the various perceptions sellers may have about the site and beyond. This forms quantifiable data about what sellers both answering to and writing the post value and can be interpreted as online or electronic word-to-mouth (eWOM). This is defined as the informal, non-commercial communication between sellers about the services offered by the site, clearly representing the user's needs and requirements in the process (Wang, Su, Shih and Luo, 2010). In the case of Etsy, its features are discussed as well as the creation and sale of products. By determining which topics are most frequently addressed, or which ones arouse the most positive or negative sentiments, eWOM can be harnessed to show what aspect of the site Etsy sellers posting in both forums value the most and what the biggest issue they may have with the site is. This process employs user generated content from the forums and the resulting eWOM to reveal seller attitudes towards the e-commerce platform, a dedicated research method known as information processing (Rodgers and Wang, 2011). Furthermore, a comparison can once again be led between both forums to show how user generated content differs, showing that sellers with differing preoccupations consult separate forums. Electronic-word-of-mouth is therefore to be used for both a cross-sectional analysis for Etsy sellers using forums and comparative study between those consulting a particular discussion board.

However, whilst interpreting eWOM through topic volumes and sentiments is a relevant method to determine what Etsy seller's value through their forum posts, engagement levels shown by answering sellers towards different separate topics, sentiments and degrees of complexity can indicate what is valued by other members of the Etsy seller's community when replying to queries. A procedure which closely resembles a study conducted by Le (2018) on a given discussion forum which used engagement metrics such as views and replies to determine if certain topics and sentiments received heightened levels of participation, indicating that for online forums covering a given topic, certain themes receive more attention and posts written in a certain tone are likely to receive more answers. This can effectively outline the functioning of each sampled Etsy forum, highlighting what posts answering sellers engage with the most through likes and replies attributed to each post. Additionally, this analysis method will be furthered by using the post complexity indicator from the content analysis to investigate whether heightened levels of engagement are noted for posts with a larger number of assigned functions. Hence, electronic word of mouth will fulfil a dual purpose of determining both what is valued by posting Etsy sellers through the nature of post interactions and what type of entries are prioritised by answering members with engagement indicators, emphasizing how both forums operate in differing manners.

III. Relating Seller Characteristics to Forum Interactions

In the final section of this research process, seller characteristics are first analysed in relation to the type of forum solicited on Etsy. It has been established that consulting different forums entail different objectives, as forums dedicated to marketing strategies and creative practices exist alongside one another. A paper by Krengel and Petrushyna (2011), explores the relationship between given user characteristics and the learning goals on an English language forum. Characteristics are defined by activity which refers in part to posts and comments made by the users, sentiment through a polarity analysis and their propensity to seek help on the forum. Correspondingly, this study considers both sampled forums as reflecting two distinct goals, using continuous variables for user characteristics such as time registered as an Etsy seller, their last visit, values relative to their activity on Etsy forums such as number of posts. Represented by sales, number of items and followers, the users shop performance is also included as a

seller characteristic, alongside further dichotomous variables taken from the shop page. According to the aforementioned logic, user characteristics should shift between forums, as two different learning goals are expressed by participation in either discussion boards. Each of these encapsulate a range of possible ambitions, the characteristics of sellers posting on a given forum should therefore change accordingly.

Finally, this study focusses on seller characteristics and the influence they have on user interactions, how they impact the way the post is written and the topic which is addressed. In a further study by Petrushyna, Kravcik and Klamma (2011), by undergoing a text processing procedure and a social network analysis in different post threads, the existence of different users fulfilling given roles within an online community was shown as being a necessary factor to ensure its sustainability. Although this paper does not resort to using these methods, it identifies certain topics as informative and others as a request for assistance. Roles correspond to experienced sellers offering advice and engaging the community and novice sellers asking for help and feedback. It is therefore expected that seller characteristics will also change from one topic to another. Moreover, the relationship between post sentiment and user characteristics will be assessed. This follows a similar aim to describing users based on their post in a given forum (Lui, 2009). Post sentiment will therefore be quantified to investigate any possible relationship between a given seller characteristic and the sentiment in which he expresses in his post. A possible relationship between time spent as a registered member and a negative sentiment is theorised by Cutolo and Kenney (2019). A model (Appendix I) is developed which demonstrates that as a seller joins an e-commerce platform, he enjoys a range of features and benefits provided by the digital marketplace, which in return profits from his entrepreneurial effort. However, as more competitors enter the market and the ecosystem for the sold good grows, gains erode, predisposing the seller to become more critical of the platform. Hence, a relationship between seller maturity and negativity needs to be evaluated on this basis. As relevant key concepts have been addressed and defined, whilst the theoretical framework has been outlined in relation to existing research and theory, this concludes the theory section.

3) METHODOLOGY

Whilst serving the primary function of an online marketplace for vintage, handmade goods and craft supplies, Etsy also gives sellers the possibility to interact on forums about various topics relative to their shop and creative activity. Past research has illustrated that information and advice is freely exchanged on the platform through the “Teams” section, where sellers form guilds based on the type of handmade good, they produce and aid one another in the form of tips and general information exchange despite being direct competitors between one another, (Kuhn and Galloway, 2015). Forums serve a similar function, but they are open to any seller and type of good sold, unlike “Teams” where access needs to be granted and where users congregate around common characteristics such as the production of a given type of item or a similar geographic location. They therefore operate as an open space where any user which registered seller can post and others can reply to his query. A total of nine forums have been established by the platform to cover the large range of possible topics Etsy sellers may wish to discuss. Given the fact that Etsy has been shown to primarily serve as a sales platform, it is also an online community for individuals with a common passion for craft good and vintage items, (Blanchflower and Hodges, 2015). Forums therefore not only give users the possibility to seek assistance for a given issue from other sellers, but they also enable them to share experiences, creative ideas and a range of other topics which go beyond increasing sales on the platform, a full description of the different Etsy groups can be found under “Appendix A”.

In order to capture a representative sample of sellers and posts, intended to study the interactions which may take place on Etsy forums and the users posting on these discussion boards in a limited sample size, a forum relating to increasing a shops sales performance and one which ties itself closer to community-based interaction about a common passion are chosen as subjects of this cross-sectional analysis. Both previously cited functions of Etsy (Blanchflower and Hodges, 2015) can thus be studied and related to one another, enabling an outline of the type of seller interaction which takes place and changes from one forum to another through sentiment and content analysis of sampled posts, presenting what is important to sellers based on forum activity in relation to given topics and finally determining if seller characteristics may influence these interactions and preferences. The two forums chosen for post and seller sampling are therefore “Marketing Your Business” and “Creative Process” as they individually relate to both the business orientated and communitarian aspects of Etsy, with the intended to provide the most accurate answer possible to the aforementioned research questions.

A. Data Collection

With the aim of providing a robust analysis of the two stated Etsy forums, the sellers which participate in them and their type of engagement, a total sample of 200 posts has been scraped and equally split between both forums in order to illustrate sellers posting on Etsy as a population. Hence, 100 posts sampled from within each, with the intention of studying the posts characteristics and the posting seller's attributes.

The sampling technique entailed starting on the first post which was written on a given date in either group: 30/01/2021. From that initial entry, one would be taken from every five posts in a systematic sampling process. Priorities were made to include 200 entries written by distinct users, if a post was encountered that was written by a seller which had already been included in the sample, the user who wrote the post prior to his would be used, whilst still counting five onwards from the duplicate seller. Individual samples for each forum therefore covered a total sampling frame of 500 posts. The sampling was conducted on the 15/05/2021 for "Marketing Your Business", which saw its 100 entries stretch from 30/01/2021 to the 08/03/2021. As "Creative Process" had a considerably lower number of entries, the 75th post was written on the 21/05/2021, a day before sampling was conducted on the 22/05/2021. The following 25 would therefore be taken from posts written before the starting date, going back from 30/01/2021 to 28/12/2020, with the priority taken to conserve the original systematic sampling method within the population frame. Hence, 45 posts taken from the "Creative Process" forum are written after the 08/03/2021 and 25 before the 30/01/2021, with the remaining 30 covering the same period as the sample extracted from "Marketing Your Business". The fact that there was such a discrepancy between the volume of posts posed a limitation for this research, as it meant either conducting two different sampling techniques between both forums to cover the same dates and consequentially having a different total breadth of posts or making one of the two cover a wider time period. The conviction was held that in order to build a representative sample of posts written in either forum, a width of 500 posts should be prioritised. Furthermore, the vast majority of characteristics taken from sellers are dependent on the date of sampling and not on the post date, meaning that the date of the entry bears no significance for the vast majority of variables.

Data from each post was manually mined in in the same process. Firstly, the content of the entry was copied with the intention of being held for a further content and sentiment analysis and the number of likes and replies attributed by members of the community, making up the post characteristics. Entries were also qualitatively categorised as relevant to the groups purpose, as there are a lot of different topics covered in the two forums not always directly relating to its goal. Posters also have the ability to mark certain answers as solutions, marking the query as solved. These two further values were noted as two additional binary variables for the post characteristics. Referred to as "Negative Reason" posts expressing frustration or disappointment were subjectively qualified in regard to the subject covered and sorted into five categories. Furthermore, the content of each post was summarized and sorted into 11 main categories with one being split into two, known as "Topic Main Categories". A full description and count of these classifications can be found in the appendix (B). This selection would be used to capture both the engagement of sellers using the forum and that of answering users. The most frequent negative posts within the sample relate to a lack of sales on behalf of sellers with technical issues also being a frequent source of negativity. Topic that are most frequently discussed are Marketing, Sales and Product Recommendation, with Community oriented posts also playing a strong role within the forums. Despite

most post being about increasing sales, sellers also exchange production advice and engage in a wide variety posts to help or engage others.

Next, the profile of the posting seller was consulted for further variables which indicated the level of his engagement within the Etsy site and community present on the forums. This is a personal page which displays information about his activity on the platform and is distinct from his shop page. This included: the number of posts made, replies that got marked as solutions by other posting sellers, likes received and given to other replies and posts, the year the seller became a member on Etsy and his last connection date. It is important to note that the aforementioned data collection limitation may impact the date when the seller became a member of Etsy and his last connection date, as nine sellers (4,5% of the total sample) listed in “Creative Process” joined Etsy after the date of the last post in “Marketing Your Business” on the 08/03/2021. This was mitigated by transforming the date joined as an ordinal variable based on yearly categories and separately using the last post date for each group to create continuous values to calculate the number of days since members joined Etsy as sellers. It is however necessary to acknowledge that some new members write on the forum and then cease engagement with the website, thus the average last connection date may be slightly skewed towards the lower end in “Creative Process”, although it should be acknowledged that 4 out of these 9 sellers have last visited the website over 40 days since sampling took place.

Data from the posting sellers shop page was then taken to illustrate the extent of which their shop was developed, this included the number of items listed on the shop page, the number of sales and the number of admirers the shop had, these are Etsy members which follow the shop to stay up to date with any updates and new items listed. Further elements present in the shop page were examined, notably the “About” section, where users can showcase information about their shop such as their workshop or production process and list links to social media channels that the shop may have. Sellers also have the possibility to offer custom made orders to buyers, listing a “Request Custom Order” button on their shop page. These further shop dispositions were noted as binary variables and then added together for each user: About section, Instagram, Twitter, Facebook, Pinterest, Personal Site and Custom Order. Finally, some shops were found to be inactive. Either no items were listed, the user was no longer selling on Etsy, the page was not found (presumably deleted by the seller or Etsy) or the seller was shown to be “Taking a Break”. This was also considered, with shops being noted as active or inactive due to one of the aforementioned reasons.

	Post		Seller				Shop			
	Likes	Replies	Posts	Solutions	Likes Received	Likes Given	Last Visit	Items	Admirers	Sales
Min	0	0	1	0	0	0	0	0	0	0
Max	50	223	83435	630	17583	15939	143	2563	11505	30907
Mean	0.985	10.165	1096	5.5377	273.3015	185.5075	40.915	86.376	450.88	964.455
Median	0	4	10	0	2	3	30	35	22	40.5
Mode	0	2	1	0	0	0	0	0	0	0
Standard Deviation¹	4.561	24.3908	6910	46.458	1399.1237	1271.14	38.231	218.45	1361.4	3323.23

Table 1: Description of Continuous Variables Describing Post, Seller and Shop Characteristics: Total Sample.

¹ The Excel function used to calculate the Standard Deviation throughout this paper is STDEV.S.

Table 1 was used to outline the described continuous variables, the disparity between sellers was notable through the minimum and maximum values along with the standard deviation. Many new coming sellers use forums in search of advice whilst some highly experienced sellers also solicit them. The mean illustrates how averages are skewed by these experienced sellers, showing that the level of engagement and experience on the website tends to be generally on the lower end for the majority of users posting in “Creative Process” and “Marketing Your Business”.

Furthermore, the binary values are outlined in Table 2 were the following: Three quarters of posts are relevant to the forums aim, but with only 10% of posts being marked as resolved by the posting seller. Over two thirds of sampled sellers have an about section in their shop, with around 30% offering the possibility to sell make custom orders for potential buyers. Different Social Media channels and personal sites were listed to varying degrees, albeit half chose not to list any at all and only 17% listing more than two (Table 3).

	Relevant	Resolved	About Section	Instagram	Facebook	Twitter	Pinterest	Personal Site	Custom Order
Yes	151	20	140	74	48	20	38	35	61
No	49	180	60	126	152	180	162	165	139

Table 2: Description of All Sampled Binary Values.

Row Labels	Count of Out of 5 Channels
0	101
1	36
2	29
3	20
4	10
5	4
Grand Total	200

Table 3: Number of Channels Displayed on Shop Page.

Shop Statuses	Count
Active	176
Inactive	24
Currently Not Selling	9
No Items Listed	7
Page Not Found	4
Taking a Break	4
Grand Total	200

Table 4: Outline of Account Statuses.

Finally, Table 4 highlights the number of active shops throughout the sample, 12% of sampled sellers had an inactive shop. These remained Etsy members, however, they disabled their shop and could still browse as regular users or they still had their shop open, just without any items listed, remaining sellers, nonetheless.

Thus, the initial data collection process has been explained whilst also providing an outline of each variable taken from the sample. Results have been aggregated between both Etsy forums to showcase how these can be analysed in unison. The next section is dedicated to the content held by each post and its interpretation through content and sentiment analysis.

B. Content and Sentiment Analysis

Post content is of great importance for determining both the manner in which sellers communicate in the forums through posts and the tone they use for engaging other users. A qualitative content analysis was employed to determine in which manner sellers would solicit the forum by attributing a selection of different function tags to the posts through a review of each sentence per sampled entry, intended to highlight how engagement from posting sellers shifts from one forum to another. The number of function tags per post was also noted as an indicator of complexity, therefore determining which forum would attract more elaborate entries and analysing it in relation to post, seller, and shop characteristics. A limitation to this study method was that intercoder reliability was not achievable, results are therefore disputable on the basis that they are obtained from a purely subjective approach. Despite this fact, it was established that this was the most insightful manner for conducting a content analysis, due to the fact that it had already been used in a forum entry analysis and remained simple yet insightful. The software Atlas.ti was then employed for a preliminary sentiment analysis, through the “English Advanced Model”, an installation which used an advanced machine learning algorithm to determine the sentiment of each sentence, sorting them into “Neutral”, “Positive” and “Negative”. A numerical value was then attributed to each category in order to devise a sentiment score for every entry. This process was then repeated qualitatively, with the positive category being divided into two separate entities, with one accounting for purely positive sentences and the other for a sentence which addresses the wider Etsy community in a positive manner. A new sentiment score was then devised thereafter, with intercoder reliability being assured by the Atlas.ti algorithm. These would then be used to determine sentiments surrounding topics and different types of users, as well as determining which forums would command a higher degree of positivity among posting sellers. Finally, results from both coding methods were aggregated to form a third sentiment score, known as the “Comprehensive” sentiment score.

I. Content Analysis

The foundation of this content analysis bases itself largely on a method called “Interaction Process Analysis”, pioneered by Bales (1950) for the study of face-to-face interactions within small groups. These could be referred to as social systems. A method consisting of sorting dialogue into twelve categories was devised to study their dynamics, thereby creating quantifiable empirical data with the intent of defining group behaviour and interaction patterns. Further studies have used this framework in order to analyse online behaviour on forums, using posts from a given universities online bulletin board as units of investigation, (Finegold and Cookes, 2006). This method of social research was modified and adapted to the digital age, expanding the twelve original categories into 24 by dividing six of the categories into two or three subcategories. An analysis using this framework would have been more detailed. However, due to the additional categories, using this expanded framework would increase the issue regarding intercoder reliability, results becoming potentially more complex and inconclusive. Instead, this content analysis based itself on an exploratory study conducted by Thelin (2016) on TheKnot.com, a forum for wedding planners and brides to be in New Jersey. It studies the effects of posts and their use by analysing 602 threads over a six-month period and categorizing them into 13 different categories. This study only splits one of the twelve categories into two distinct ones. Twelve are therefore based on Bales (1950) interaction process analysis taken from: “A Set of Categories for the Analysis of Small Group Interactions” and supplemented by one category from Finegold and Cookes (2006) study, intended to aid in adapting the content analysis to an online context.

This updated version of “Interaction Process Analysis” had two main categories: The “Social Emotional” and the “Task Area” category. The first was related to emotive content posted onto the forum, positive and negative. The second category corresponded to the manner in which the query was organised, precisely defining how the seller is writing his post. As some may choose to write just a simple questions and others a long paragraph, using different ways of explaining themselves as well as asking multiple types of questions. Thus, there are 2 subcategories for each main category: “Positive” and “Negative” for the “Social Emotional” area. For the “Task Area”, the two were “Attempted Answers” where the user engages in self descriptive behaviour and “Questions” where he directly engages in an enquiry. These subcategories are further sorted into three each, with one of the “Questions” classifications being split into two by Thelin (2016) in order to bring more precision on how sellers ask for information in forums. A complete description of each of these categorizations can be found under “Appendix D”. Finally, as there are emotive categories, elements of sentiment analysis are included in the “Interaction Process Analysis”. However, this is on a purely functional basis, negative and positive categories help in defining the purpose of the written content and do not seek to capture overarching sentiments.

A preliminary “Interaction Process Analysis” revealed the most frequent functions used throughout the total sample (Table 5), with the three highest values all being attributed to the “Task Area: Attempted Answers”. This showed that sampled posts were written in a more elaborate way than simple question writing. Entries were shown to provide information to other users to help give a precise solution most frequently. When questioning other sellers, users would most frequently ask for suggestions than any other “Task Area: Question” categorisation. Posts were more likely to be tied to the “Shows Tension” through their content than “Shows Tension Release”. Despite this, a high level of positive community interaction was perceived, as the “Shows Solidarity” subcategory is the most frequently used of all the “Social Emotional” classifications. The number of functions attributed to each post was also added together as determinant of their complexity, as a post with only one or two functions can be considered simple in comparison to one with five or six. Posts ranged from one to eight attributed IPA functions, showing that over half of entries are written in a moderately complex manner, although other posts are almost three times more frequently simple than complex or highly complex, (Table 6).

IPA Function Name	Count Total Sample	% of Total Sample
1.Shows Solidarity	64	10.4
2.Shows Tension Release	36	5.8
3.Agrees	1	0.1625
4.Disagrees	1	0.1625
5.Shows Tension	49	7.94
6.Shows Antagonism	8	1.3
7.Asks for Orientation	45	7.3
8.Asks for Personal Info	41	6.65
9.Asks for Opinion	55	8.9
10.Asks for Suggestion	73	11.8
11.Gives Suggestion	91	14.75
12.Gives Opinion	70	11.34
13.Gives Orientation	83	13.45
Total	617	100

Table 5: IPA Function Count and Percentage in Total Sample.

Post Complexity	Number of Post Functions	Post Count	Complexity Category %	Individual Category %
Simple	1	21	35.5	11.5
	2	50		25
Moderate Complexity	3	62	52	31
	4	42		21
Complex	5	16	11	8
	6	6		3
High Complexity	7	2	1.5	1
	8	1		0.5
Total		200	100	100

Table 6: Number of Post Functions and Complexity Category Count with Percentage of Total Sample.

II. Sentiment Analysis

Automatic Coding

In order to capture the general tone present amongst sellers posting in the “Marketing Your Business” and “Creative Process” forum and to highlight how a given network may determine user sentiment, a manual and automatic text mining procedure was carried out to analyse the 200 sampled post. This process based itself on Neihart, Rümmele and Werthner’s (2021) study which conducts a sentiment analysis for comments in a travel forum, using the process of part-of-speech tagging with the software program SentiWordNet in order to assess the emotion of user-generated content. This was a lexicon-based sentiment analysis which attributed a value to each individual word to determine a sentiment score for each sentence. Each user has his score determined by adding the sentences of each post together and calculating an average. The following content analysis drew inspiration from this process to engage in a simplified version using the Atlas.ti “English Advanced Model”, which has an integrated function which uses machine learning and artificial intelligence models to automatically code sentences in order highlight sentiments expressed in a given piece of data, (Kalpokas and Radivojevic, 2021). Reported phrase sentiments were either “Neutral”, “Negative” or “Positive” and a separate value was attributed to each of them and then the average score between each of the posts sentences was calculated as follows:

$$\text{Sentiment Score Per Post} = \frac{\text{Neg.} + \text{Pos.} + \text{Neu.}}{\text{Num. of Sentences}}$$

The sentence scores:

Negative = 0

Neutral = 0.5

Positive = 1

This process yielded a sentiment score comprised between 0 and 1, with every score under 0.4 considered negative and any value over 0.7 counted as positive with sentiment scores between 0.4 and 0.7 counted as neutral. Hence, by submitting the 200 sampled posts into the Atlas.ti software, an automated sentiment analysis was carried out, classifying each sentence as positive, negative, or neutral. The user sentiment score was manually calculated thereafter. The results of the Atlas.ti sentiment analysis were mainly distributed between the negative and neutral category, with 22% of posts having been attributed a score between 0.5 and 0.6 (Appendix C). The average sentiment score attributed by Atlas.ti to the sample is

0.473 (Table 7), with a median and mode of 0.5, proof that sampled posts are most frequently neutral.

Qualitative Coding

However, despite its quality signals, the Atlas.ti sentiment analysis does display coding inconsistencies which need to be manually addressed (Kalpokas and Radivojevic, 2021). Thus, a qualitative sentiment analysis was also carried out with the use of Atlas.ti, with sentences coded manually. Studies have revealed the important role that the wider role the wider Etsy community plays in these forums with a tightly knit group of sellers exchanging knowledge, (Blanchflower and Hodges, 2015). Other studies have shown that a positive attitude towards other members is present in online groups and forums in order to favour knowledge exchange and to allow a sharing culture to flourish, (Pi, Chou and Liao, 2013). A lot of positivity highlighted in posts is therefore directed at other sellers rather than about features and services provided by Etsy itself, or the posters personal performance and satisfaction. The decision was therefore taken to split the Positive category in to two distinct ones: Positive and Positive Community. Where the second one, is closely tied to the “Social Emotional Positive: Solidarity” category from the content analysis. A full description of each qualitative sentiment code can be found under Appendix D. The formula for calculating the qualitative sentiment score for each post becomes:

$$\text{Sentiment Score Per Post} = \frac{\text{Neg.} + \text{Pos.} + \text{Neu.} + \text{Pos C.}}{\text{Num. of Sentences}}$$

Because both forums have users which engage other sellers positively, the decision was taken to assign a sentiment score to “Positive Community” sentences which are dependent on the overall level of “Positive” sentences in the forum, therefore adding more weight to purely positive sentences rather than letting community interactions inflate sentiment scores. Hence, scores for Positive, Neutral and Negative sentences remain unchanged, however the Positive Community score becomes a function of the total level of positivity present throughout the forum and is calculated as follows:

$$\text{Positive Community} = 0,5 + 0,5 \left(\frac{\text{Number of Positive}}{\text{Number of Positive Community}} \right)$$

The same manual calculation process was carried out with the new sentiment scores, with the new scores revealing a tendency to shift posts towards the neutral category, reducing both positive and negative category scores. However, the positive posts suffered a greater reduction, something which was predictable given that many positive sentences were now reassigned a lower value, as they were now dependant on the total level of positivity in the given forum. The most frequent sentiment score in the manual categories remained the same between both coding processes, with 31% of posts getting a score between 0.5-0.6 (Appendix F). Mean, median and modal values also remained roughly the same at 0.495, 0.5 and 0.5 respectively, a statement of intercoder reliability between the manual and automated analysis methods.

Finally, as intercoder reliability was achieved between both coding methods, using the average between both sentiment scores created a new sentiment score, known as the “Comprehensive Sentiment Score”, using the values which stem from both coding methods. This was done with the intention of using it to simplify certain research processes where multiple tables would be required to analyse the relationship between a given set of variables (Tables 26, 27 and 35). The variable description below reflects the proximity between each of the three variables obtained by manual and automated coding, the sentiment description and distribution can be found in the appendix (G).

	Manual Coding	Atlas.ti Coding	Comprehensive
Min	0	0	0
Max	1	1	0.964
Mean	0.495	0.473	0.484
Median	0.5	0.5	0.4818
Mode	0.5	0.5	0.5
Standard Deviation	0.184	0.279	0.1921

Table 7: Manual, Automatic and Comprehensive Sentiment Score Variable Description.

C. Research Process

The first step of this study was to conduct a comparative analysis between the two forums. Results from the individual content and sentiment analysis for each forum were taken and compared with one another with the intention of illustrating how interactions and engagement vary between both discussion boards. The content analysis revealed how posts were written in each forum, determining the most used "Interaction Process Analysis" functions in each forum. Their quantity per post was used as an indicator of complexity, different complexity categories were established for each number of functions with the aim of revealing which forums had entries written in the most complex manner on average. A similar process was carried out for the sentiment analysis, with sentiment categories created to illustrate which forum contained more positive, neutral, or negative interactions. Results from both the qualitative and automatic coding methods were compared between both forums, to illustrate how overall sentiment shifts from one forum to another. Next, by using the weighted average of the number of functions for each post in a given sentiment classification, post complexity was studied in relation to sentiment categories in each forum, before focussing on external engagement from other sellers and the topics covered in each discussion board. Metrics such as post volume, likes and replies were studied and compared across both forums to illustrate how engagement changes between discussion boards. Variables such as resolved posts, qualitatively assigned topic categories, forum relevance and negativity reason were also compared, adding further depth towards how interactions change between Etsy forums.

The analysis then continued by studying what was shown to be important to both Etsy sellers who write entries in the two forums and those who answer them. This was done by studying rates of engagement in relation to the topics covered in the discussion boards, using average likes and replies per topic category and negative reason categories to illustrate what answering sellers like interacting with the most in each forum. The investigation is then turned to the sellers writing the posts, initially by revealing which topics are most likely to be resolved by the posting seller. The average sentiment scores per post topic and negative reasons were then outlined to illustrate which subjects were written about in the most positive or negative way, thus revealing what sellers valued the most and the least in each Etsy forum. Finally, the weighted average of external engagement metrics was related to post complexity and sentiment in order to show if answering sellers prefer interacting with simple or intricate posts and positive or negative posts. This part of the research process therefore illustrated in detail what the engagement preferences of answering sellers were and the sentiment of posting sellers in relation to the different topics covered by the two discussion boards, displaying what is most valued and disliked on the platform.

The final stage of this research project focussed on seller and shop characteristics. The comparative analysis was continued as sampled continuous, ordinal, and binary variables were examined and contrasted between each forum in order to describe how the attributes of Etsy sellers using forums changes between discussion boards. A cross-sectional analysis was then adopted by plotting these characteristics against the post topics, in order to see how seller attributes, shift in relation to the topic that is being posted about. This procedure was repeated with the binary variables and concluded the first step in attempting to answer how these seller features determine the type of interaction that is made within Etsy forums. Finally, establishing a relationship between these variables and the comprehensive sentiment score was attempted. This was undertaken through a multivariate analysis, by building a correlation matrix which assessed the strength of a relationship between a given seller or shop

characteristic with the post sentiment. Variables were first uploaded into the RStudio² integrated development environment and the “GGally” library was installed as to visualise the scatter plot of each variable through the “ggpairs” function, creating a pairwise comparison of sampled multivariate data. Because many variables had outliers, the process was repeated with the logarithm of each value. Two different scatter plot matrixes were therefore created displaying the correlation coefficients between two variables. These were used as correlation matrixes to determine if any statistical relationship could be witnessed between sentiment score and the aforementioned variables. Finally, a bivariate analysis was also carried out using the weighted average of seller characteristics in relation to sentiment score categories, concluding the section on how these may influence and determine the type of interaction that is made by sellers posting on Etsy forums, along with the overall research procedure of this analysis.

² Coding Procedure: `library("readxl"), A=read_excel("Document Name"), library(GGally), library(ggplot2), ggpairs(A[,1:9], aes(colour = "red" , alpha = 0.8)), ggpairs(A[,9:16], aes(colour = "red" , alpha = 0.8))`

4) RESULTS

A. User Engagement and Interactions

I. Content Analysis

The first step in this analysis is to investigate how seller engagement on the two forums “Marketing Your Business” and “Creative Process” may vary from one to another. The most obvious point is the volume of total entries in each individual discussion board, which is a simple way of highlighting which forum attracts the most traffic. As previously mentioned, using the same sampling method, 500 posts in “Marketing Your Business” covered the period of 36 days, whilst “Creative Process” covered 142. This shows a vast disparity in activity between both forum as the former gets on average around 14 posts a day and the latter only 3.5. As of the 22/05/2021, the total amount of pages in each forum is 3736 and 395, respectively. With each containing ten posts, one can assume that there is 9.5 times more posts in “Marketing Your Business”. Seller’s consulting Etsy forums are therefore more likely to post into that discussion board, with the sales-oriented topic of marketing seemingly attracting more interest than creative production processes. This can be interpreted as a sign that information about how to increase sales is more sought after, than engaging as a community and exchanging creative ideas.

By analysing which “Interaction Process Analysis” categories are most frequently found in the entries of each discussion board, the general manner in which sellers write posts can be deduced for each forum. All functions have been counted and listed with their respective percentage in the total forum sample in Table 8 and 9. Results indicate that the Task Area remains roughly the same between both samples, with the category “Suggestions: Attempted Answers” being the most attributed function in either forum, showing that many posts seek to elaborate a clear topic for other sellers to be able to respond to in the clearest way possible. Sellers in both forums also both tend give information about themselves and their shop to the same degree (“Gives Orientation”). However, posters in “Creative Process” give marginally more opinions about their objectives and what they would like to achieve through their entries (“Gives Opinion”). Interestingly, posts that fall into the “Task Area: Questions” classification is attributed to 36.09% of posts in “Marketing Your Business” and only 32.76% in “Creative Process”. This can be tied to the fact that posts in the second forum tend to be more descriptive, with more posts being written without directly writing a question. Another difference in this category is that there consequently more posts asking for opinions in “Marketing Your Business”, due to many posts asking for feedback in regard to the seller’s shop amongst other topics. Differences are larger in the “Social Emotional” category with the “Shows Tension” category being twice as prevalent in “Marketing Your Business”, whilst “Shows Solidarity” is over twice more frequently tied to entries in “Creative Process”. It could be assumed that more entries have a negative attitude towards Etsy in the first discussion board and that posts in the second tend to refer to and engage other members of the Etsy community more positively, showing the differences between a sale focussed and a community orientated forum. However, the “Tension Release” categorisation has more entries in “Marketing Your Business”, showing that users have a higher tendency to exhibit positive behaviour on the forum. The “Shows Antagonism” category, albeit non-existent in the former is sampled in “Creative Process” due to sellers reacting negatively to suppliers and other sellers regarding copyright infringement. Although the way users write posts in both forums remains roughly the same, emotive content tends to shift from one forum to another. Thus, a sentiment analysis is required to investigate this difference further.

If the number of categories attributed to each post is considered an indicator of complexity, as a higher number of functions signify that the post is written in a more sophisticated manner than simply asking for basic information, sorting posts in terms of the number of functions attributed will outline which forum attracts the most intricately written queries (Table 10). Respective averages are 3.27 and 2.93, proof that posts in “Marketing Your Business” are generally more complex. However, the creation of complexity categories can explain this in more detail. Both forums have the same percentage of simple posts, whilst posts in “Creative Process” are twice as likely to be of “Moderate Complexity”, posts in “Marketing Your Business” are twice as frequently “Complex” or “Highly Complex”, showing the reason for this disparity in averages.

Content analysis has therefore been employed to show how both post content and complexity varies from one forum to another. Although, “Marketing Your Business” captures higher levels of engagement from sellers, posts are generally written in the same manner with a few small differences. What changes between both groups is the emotive content, with more community solidarity being detected in “Creative Process”, albeit with more antagonism directed towards other sellers and suppliers. Posts in that forum were more likely to be written in a moderately complex way, whilst the other group had more entries classified as “Complex” or “Highly Complex”, showing how seller engagement and interaction vary across both forums.

IPA Function Name	Count Forum Sample	% of Forum Sample
1.Shows Solidarity	23	7.03
2.Shows Tension Release	21	6.42
3.Agrees	1	0.31
4.Disagrees	0	0
5.Shows Tension	37	11.31
6.Shows Antagonism	0	0
7.Asks for Orientation	26	7.95
8.Asks for Personal Info	20	6.12
9.Asks for Opinion	36	11.01
10.Asks for Suggestion	36	11.01
11.Gives Suggestion	48	14.68
12.Gives Opinion	34	10.40
13.Gives Orientation	45	13.76
Total	327	100

Table 8: IPA Function Count and Percentage of “Marketing your Business” Group.

IPA Function Name	Count Forum Sample	% of Forum Sample
1.Shows Solidarity	42	14.33
2.Shows Tension Release	15	5.12
3.Agrees	0	0
4.Disagrees	1	0.34
5.Shows Tension	12	4.10
6.Shows Antagonism	8	2.73
7.Asks for Orientation	19	6.48
8.Asks for Personal Info	21	7.17
9.Asks for Opinion	19	6.48
10.Asks for Suggestion	37	12.63
11.Gives Suggestion	43	14.68
12.Gives Opinion	37	12.63
13.Gives Orientation	39	13.31
Total	293	100

Table 9: IPA Function Count and Percentage of “Creative Process” Group.

Complexity Categories	Number of Post Functions	Marketing Your Business	Category %	Creative Process	Category %
Simple	1	9	35	11	35
	2	26		24	
Moderate Complexity	3	24	27	37	56
	4	23		19	
Complex	5	10	15	7	9
	6	5		2	
High Complexity	7	2	3	0	0
	8	1		0	
	Average	3.27		2.93	
	Total	100	100	100	100

Table 10: Number of Post Functions and Complexity Category Count with Percentage for Both Forums.

II. Sentiment Analysis

In order to employ the sentiment analysis method described in the “Methodology” section to describe how sentiment changes from one forum to another, it is first necessary to calculate the sentiment score attached to the “Positive: Community” category. Table 11 describes the frequency of each category within both forums:

Qualitative Sentiment Category	Marketing Your Business	% of Forum	Creative Process	% of Forum
Positive	36	7.29	52	9.92
Positive: Community	115	23.28	73	13.93
Negative	116	23.48	100	19.08
Neutral	227	45.95	299	57.07
Total	494	100	524	100

Table 11: Qualitative Sentiment Coding for “Marketing Your Business” and “Creative Process”.

In terms of Positivity directed towards other members of the Etsy seller community, “Marketing Your Business” has more sentences coded as positive community. Although more posts in “Creative Process” are labelled with the “Social Emotional: Solidarity Tag”, there is larger volume of sentences which fit into the “Positive: Community” classification in the forum dedicated to marketing. There is also a slight difference in number of “Positive” sentences and “Negative” in total volume, but the biggest difference occurs in the “Neutral” with over 11% more sentences in “Creative Process” being sorted into that category. As the proportion of “Positive: Community” changes from one group to another, its value in each forum as a function of the level of “Positive” will be calculated as follows:

Marketing Your Business:

$$\text{Positive Community} = 0,5 + 0,5 \left(\frac{36}{115} \right) = 0.6535$$

Creative Process:

$$\text{Positive Community} = 0,5 + 0,5 \left(\frac{52}{73} \right) = 0.856$$

The three different types of sentiment codes attributed automatically by the Atlas.ti “Advanced English Package” are outlined in Table 12. Note that the number of sentences between both analysis methods vary due to the fact that the qualitative process counts paragraphs which have been copied and pasted as one sentence, whilst Atlas.ti also counted multiple sentences as one when the posting seller did not use proper punctuation.

Atlas.ti Sentiment Category	Marketing Your Business	% of Forum	Creative Process	% of Forum
Positive	152	31.67	190	34.73
Negative	229	47.71	237	43.33
Neutral	99	20.63	120	21.94
Total	480	100	547	100

Table 12: Automatic Sentiment Coding for “Marketing Your Business” and “Creative Process”.

Results indicate that out of the total volume of sentences in each sampled forum, there is a higher level of “Negative” posts in “Marketing Your Business” and a greater proportion of sentences in “Creative Process” are coded as “Positive”, whilst also having a higher degree of “Neutral” sentences. This is consistent with the qualitative coding. However, the proportions of phrases coded as “Negative” are much higher in both groups when using Atlas.ti to conduct the analysis. Because the “Neutral” category is higher with the qualitative process, this indicates that many sentences that would be manually coded as “Neutral” are automatically coded as “Negative” by Atlas.ti. The description of the 2 resulting sentiment scores for each forum is outlined by the following table:

Forum	Marketing Your Business		Creative Process	
Coding Method	Qualitative	Atlas.ti	Qualitative	Atlas.ti
Min	0	0	0	0
Max	0.875	1	0.9283	1
Mean	0.437	0.4455	0.5176	0.499
Median	0.5	0.45	0.5	0.5
Mode	0.5	0.5	0.5	0.5
Standard Deviation	0.1709	0.2768	0.1949	0.28

Table 13: Sentiment Score Description in Both Forums and with Both Coding Processes.

Results between both the qualitative and automatic coding methods are shown to be consistent with one another. Because there are more “Positive” values with Altas.ti that are equal to one, sentiment scores tend to be closer to one, explaining the divergence in standard deviation between both methods in either forum. The mean reflects a divergence of 8.06% for the qualitative coding method and 5.35% for the automatic method between both forums, therefore indicating a higher average sentiment score for “Creative Process” and implying that sellers posting in “Marketing Your Business” are more likely to be writing negative entries. This can be also seen by distributing different posts into sentiment score categories (Table 14 and 15).

Sentiment	Score Category	Quali. Count	% of Forum	Atlas.ti Count	% of Forum
Negative	0-0.1	3	30	10	42
	0.1-0.2	3		9	
	0.2-0.3	7		11	
	0.3-0.4	17		12	
Neutral	0.4-0.5	17	62	9	38
	0.5-0.6	34		24	
	0.6-0.7	11		5	
Positive	0.7-0.8	6	8	10	20
	0.8-0.9	2		1	
	0.9-1	0		9	
200	Total	100	100	100	100

Table 14: Score Category Count and Percentage in “Marketing Your Business” with Both Coding Methods.

Sentiment	Score Category	Quali. Count	% of Forum	Atlas.ti Count	% of Forum
Negative	0-0.1	2	26	7	37
	0.1-0.2	5		9	
	0.2-0.3	7		5	
	0.3-0.4	12		16	
Neutral	0.4-0.5	11	56	7	39
	0.5-0.6	28		20	
	0.6-0.7	17		12	
Positive	0.7-0.8	12	18	5	24
	0.8-0.9	4		6	
	0.9-1	2		13	
	Total	100	100	100	100

Table 15: Score Category Count and Percentage in “Creative Process” with Both Coding Methods.

Sorting the sentiment score for each post into “Positive, Neutral and Negative” categories confirms that posts in the forum “Creative Process” are more likely to be included in the “Positive” than in “Marketing Your Business”, using both the qualitative and automatic coding processes to determine sentiment scores. The “Neutral” remains the same between both forums with the use of Atlas.ti, albeit slightly lower in “Creative Process” using manual coding. Finally, more posts are classified as “Negative” in “Marketing Your Business” using both coding process, showing that sentiment may shift from one Etsy forum to another. In this case, sales and marketing orientated forums capture more negativity and less positivity than a community orientated discussion board were sellers exchange information about production and creativity.

III. Sentiment in Relation to Post Complexity

By visualising the average number of functions attributed to each post for each sentiment score category, it is possible to determine if more complicated posts are more likely to be written in a negative way for each forum. Results across both coding methods are generally close to their respective forum averages, except for “Negative” posts which are coded manually in “Marketing Your Business”. They are generally written in a simpler way than average, but results are not supported by Atlas.ti. Posts classified as “Positive” have less functions on average in “Marketing Your Business” across both coding processes, although the difference is most apparent with the automatic coding provided by Atlas.ti and confirmed by the “Comprehensive” sentiment score (Appendix H). In “Creative Process” Positive posts are shown to be written in a slightly simpler manner than average, although results cannot be fully conclusive as there is a divergence between both coding processes.

Results generally indicate that there is no direct relation between the number of post functions and a negative or positive sentiment. As most average number of functions per sentiment category were close to the forum average and any divergence could not be confirmed by the intercoder reliability between both coding processes.

IV. Forum Post Topics, Likes and Replies

Finally, the number of likes and replies that posts get on average in either forum is a good indicator of how engagement levels may vary between forums. The post topics, otherwise referred to as “Main Categories” between each forum also indicate how content may change between both. The description of likes and replies in each separate group can be found below:

	Marketing Your Business		Creative Process	
Post Characteristic	Likes	Replies	Likes	Replies
Min	0	0	0	0
Max	6	59	50	223
Mean	0.27	6.96	1.7	13.37
Median	0	4	0	3.5
Mode	0	4	0	2
Standard Deviation	0.8973	9.492	6.32216	32.9391

Table 16: Description of Post Likes and Replies for Both Forums.

Despite having a considerably higher maximum and standard deviation, posts in “Creative Process” are more likely to be liked by at least one other seller. Sampled posts also get twice as many replies on average than in “Marketing Your Business”, indicating that there may be more community interaction in that particular forum. One could also assume that with the considerably higher volume of entries being posted to the latter, less sellers are available to answer every query. Despite not being a fully trustworthy indicator of engagement for this reason, post likes and replies will serve as a useful tool to answer what other sellers show to value when interacting in these two Etsy forums. Both also contain distinct content which is reflected by the topics that are addressed in the discussion board (“Main Categories”). These vary from forum to forum and need to be accounted for in order to effectively answer how engagement changes between both groups, it is also useful to see which topics are most likely to be resolved by the posting seller, or which ones have been qualitatively counted as relevant to the groups purpose or negative:

Topic Main Category	Number of Posts	Marked as Resolved		Counted as Negative		Counted as Relevant	
		Yes	No	Yes	No	Yes	No
Anecdote	1	0	1	0	1	0	1
Community	7	1	6	0	7	3	4
Copyright Infringement	0	0	0	0	0	0	0
Feedback	7	1	6	2	5	4	3
Marketing	33	4	29	16	17	32	1
Personal Intro	0	0	0	0	0	0	0
Production Recommend	1	0	1	0	1	0	1
Sales	26	3	23	19	7	24	2
Site Info	15	3	12	4	11	10	5
Social Media	10	0	10	3	7	9	1
Technical Issue	0	0	0	0	0	0	0
Total	100	12	88	44	56	82	18

Table 17: “Marketing Your Business” Forum Content Description.

Topic Main Category		Number of Posts	Marked as Resolved		Counted as Negative		Counted as Relevant	
			Yes	No	Yes	No	Yes	No
Anecdote		5	0	5	2	3	2	3
Community		15	0	15	1	14	13	2
Copyright Infringement	a. Seller	6	2	4	3	3	6	0
	b. Other Seller	5	1	4	5	0	5	0
Feedback		7	1	6	2	5	3	4
Marketing		4	0	4	2	2	2	2
Personal Intro		5	1	4	0	5	1	4
Production Recommendation		27	1	26	1	26	27	0
Sales		7	1	6	6	1	0	7
Site Info		15	1	14	4	11	9	6
Social Media		0	0	0	0	0	0	0
Technical Issue		4	0	4	4	0	1	3
Total		100	8	92	30	70	69	31

Table 18: “Creative Process” Forum Content Description.

Negative Reason	Marketing Your Business	Creative Process
Copyright Violation	0	8
Issue with Etsy	4	4
Lack of Sales	32	8
Technical Issue	8	7
Rant	0	3
Total	44	30

Table 19: Negative Reasons for Posts in Both Forums

Analysing both forums in this manner reveals some useful insights about the discussion boards functioning and the content which is being discussed. For example, the three most discussed topic “Main Categories”

in “Marketing Your Business” are “Sales”, “Marketing” and “Site Info”. In “Creative Process” these are “Production Recommendation”, “Community” and “Site Info”. Therefore, some convergence between both groups is discernible, although the most popular topics remain sales orientated in one and geared towards a creative community interacting with one another and exchanging advice in the other. As well as content, sellers posting in “Marketing Your Business” are more likely to mark their posts as resolved, their posts are more likely to subjectively be counted as negative, mainly because frustration about a lack of sales is expressed by the posting seller. However, entries in “Creative Process” often relate to feedback, sales, and marketing. These topics are best suited to other forums. Thus, a high number of posts are counted as not relevant to the discussion board. Finally, the different reason for negative content to be posted in each forum is displayed in Table 19. Once again, the main convergence regarding negativity in posts between both forums is “Lack of Sales”, sellers in both groups also express frustration regarding technical issues and with general ways the Etsy marketplace functions. However, negativity regarding “Lack of Sales” is the main in “Marketing Your Business”, whereas it is on equal footing in “Creative Process” with problems regarding “Copyright Violation” and “Technical Issues”. Hence, using post topics in relation to posts being resolved by the seller or being counted as negative and relevant is a useful way of showing how engagement and interactions change between both groups. The “Negative Reason” category supplements this knowledge by showing what posting sellers are negative about in either forum.

B) Topics Shown to be Important to Etsy Sellers from Forum Activity

I. Topic Main Categories

Answering Sellers.

Post characteristics such as likes, replies, resolutions, relevance, sentiment scores or complexity can also be used to determine what is important to Etsy sellers based on their forum activity. This can first be achieved with the total volume of post topics within the total sample (Appendix B2) which present “Marketing”, “Sales”, “Production Recommendation” and “Community” entries as the most popular discussion topics. Hence, what is valued the most by Etsy sellers that post in either forum. This has already been addressed and differs between either forum. However, calculating the average number of likes and replies per topic “Main Category” is useful to show what is most important to answering sellers, whilst the use of sentiment scores will determine what is important to the posting sellers.

Topic Main Category	Number of Posts	Average Likes	Average Replies
Anecdote	6	7.3333	31.3333
Community	23	4.8695	33.652
Copyright Infringement	11	0.1818	11.3636
Feedback	14	0.4286	6.357
Marketing	37	0.2162	8.108
Personal Intro	5	0	3.2
Production Recommend	28	0.25	5.5357
Sales	33	0.2727	5.3030
Site Info	29	0.2061	4.7586
Social Media	10	0.3	5.9
Technical Issue	4	0	3.5
Total	200	0.985	10.165

Table 20: Average Number of Likes and Replies Per Main Categories for Total Sample.

Forum	Marketing Your Business			Creative Process		
Topic Main Category	Number of Posts	Average Likes	Average Replies	Number of Posts	Average Likes	Average Replies
Anecdote	1	4	4	5	8	36.8
Community	7	1.1428	5.2857	15	6.9333	43.8
Copyright Infringement	a. Seller	0	---	6	0.4	5.2
	b. Other Seller			5	0	16.5
Feedback	7	0.1428	5.2857	7	0.7143	7.4285
Marketing	33	0.2424	7.9697	4	0	9.25
Personal Intro	0	---	---	5	0	3.2
Production Recommend	1	0	2	27	0.2592	5.6666
Sales	26	0	5.1923	7	1.28571	5.7143
Site Info	15	0.2	5.333	15	0.2	3.9333
Social Media	10	0.3	5.9	0	---	---
Technical Issue	0	---	---	4	0	3.5
Total	100	0.27	6.96	100	1.7	13.37

Table 21: Average Number of Likes and Replies Per Main Categories for Both Forums.

By sorting the average number of likes and replies per post in the whole sample by main categories, it is possible to see what answering sellers tend to like the most and what stimulates the most discussions across both forums. Topic categories such as “Anecdote” and “Community” both have considerably higher average likes and replies showing that answering sellers are most likely to engage with posts aimed at the wider Etsy community. When posts focus on a precise subject such as “Production Recommendation”, “Social Media”, “Technical Issue” or “Site Info”, likes and replies are considerably lower than when topics are broader, although more complicated problems such as those related to “Copyright” capture higher levels of engagement than average. Moreover, the same can be stated for business-minded topics such as “Sales”, “Marketing”, “Feedback” and “Personal Intro”. Once again, it can be confirmed that community orientated topics solicit more engagement from other sellers. Results can also be visualized by distributing average likes and replies per topics between both forums (Table 21).

This enables an outline of what is most important to answering sellers in each separate forum. In “Marketing your Business”, most categories have similar averages of replies and likes but posts related to “Marketing” show significantly higher average reply to levels. This could indicate that answering sellers value posts which stick to the general aim and goal of the forum. In “Creative Process”, results remain skewed towards “Anecdotes” and “Community” in terms of average replies and likes, with “Marketing” also possessing a high reply rate. However, deconstructing the “Copyright Infringement” category has shown that queries about other sellers infringing on one’s copyright garner more replies than the seller being given an infringement notice, a sign of sympathy and solidarity from answering sellers to those who find themselves in such situations.

This method can be replicated for “Negative Reason” to show what issue posted by sellers, answering users engage the most with (Table 22). In “Marketing Your Business” this is revealed to be “Lack of Sales” which is very frequently mentioned and shows that users are most likely to respond to these issues, offering advice. The number of replies coincides with posts which are not labelled as negative and likes are above average, showing that engagement over this issue can be considered high, as all other “Negative Reason” categories fall below this value and the forum post average. Furthermore, in “Creative Process”, issues which attract the most engagement are “Issues with Etsy” and “Rants”, their values are also significantly higher than the forum average and posts that are were not classified as negative. This shows what “Negative Reason” categories answering sellers like interacting with the most in either discussion board.

Negative Reason	Marketing Your Business	Average Likes	Average Replies	Creative Process	Average Likes	Average Replies
Copyright Violation	0	----	----	8	0.25	11.5
Issue with Etsy	4	0	1	4	3.5	17.75
Lack of Sales	32	0.3125	7.5	8	1.75	8.625
Technical Issue	8	0.125	3.5	7	0	3.5714
Rant	0	----	----	3	5	42.333
None	56	0.2857	7.5714	70	1.8116	13.7391
Total	100	0.27	6.96	100	1.7	13.37

Table 22: Negative Reason Categories with Average Likes and Replies for Both Forums.

Posting Sellers

Highlighting which topics are most likely to be resolved by the posting seller can supplement this analysis by showing which answers are most valued by forum users (Table 23). Out of the 10% of posts marked as resolved, three-quarters of resolutions are made for topics which require definitive answer such as “Copyright Infringement”, “Site Info”, “Sales” and “Marketing”. This highlights how sellers posting in Etsy forums value precise answers the most when consulting others for the solution to a given issue.

Topic Main Category	Number of Posts	Marked as Resolved	
		Yes	No
Anecdote	6	0	6
Community	23	1	23
Copyright Infringement	11	3	11
Feedback	14	2	12
Marketing	37	4	33
Personal Intro	5	1	4
Production Recommend	28	1	27
Sales	33	4	29
Site Info	29	4	25
Social Media	10	0	10
Technical Issue	4	0	4
Total	200	20	180

Table 23: Topics Marked as Resolved Out of Total Sample.

Forum		Total Sample		Marketing Your Business		Creative Process	
Topic Main Category		Average Quali.	Average Atlas.ti	Average Quali.	Average Atlas.ti	Average Quali.	Average Atlas.ti
Anecdote		0.616	0.5486	0.875	0.5	0.56428	0.5583
Community		0.5802	0.569	0.5985	0.616	0.577	0.5184
Copyright Infringement	a. Seller	0.3884	0.4804	----	----	0.4494	0.6026
	b. Other Seller					0.3152	0.3338
Feedback		0.5123	0.438	0.5411	0.4071	0.4836	0.4689
Marketing		0.4512	0.3684	0.4509	0.363	0.4538	0.4125
Personal Intro		0.8051	0.8366	----	----	0.8051	0.8366
Production Recommend		0.587	0.4739	0.7883	0.75	0.5796	0.4636
Sales		0.4372	0.5299	0.4623	0.5418	0.3441	0.4857
Site Info		0.4473	0.3818	0.4051	0.3021	0.493	0.5027
Social Media		0.4684	0.5549	0.4684	0.555	----	----
Technical Issue		0.3317	0.3918	----	----	0.3317	0.3918
Total		0.4953	0.4728	0.473	0.4456	0.5175	0.4999

Table 24: Average Qualitative and Automatic Sentiment Score Per Topic Main Category for Total Sample and Both Forums

In order to further investigate which topics are most valued by posting sellers, it is possible to display the average sentiment score for each topic to see which one is written about in the most negative manner and

thus, the most likely to be considered as negative by sellers posting onto Etsy forums. This analysis is carried out using both the qualitative and the automatic (Atlas.ti) sentiment score and calculating the average for each category, showing the resulting average sentiment score for each topic “Main Category” in the total sample and in both forums individually.

This process is used to show which topics sellers refer to in the most positive or negative way in either group. For example, in “Marketing Your Business”, topics relating to “Site Info” and “Marketing” are most likely to be written in a Negative way, implying that these are what sellers posting into the forum dislike the most due to their low sentiment scores. The categories “Sales” and “Social Media” have a higher sentiment score, implying that sellers address these in a positive way. In “Creative Process”, topics relating to “Technical Issues” and “Copyright Infringement: Other Seller” have the lowest sentiment scores, showing that these are what affects sellers posting onto this discussion board the worst. When it is the seller committing the copyright infringement, average sentiment scores are considerably higher. The “Topic Personal” intro is given the highest sentiment score, showing that sellers employ a positive tone when introducing themselves. Finally, the community centred topics: “Anecdote” and “Community” have a high sentiment score in general, once again maintaining the idea that posts aimed towards the Etsy seller’s community are positively perceived by sellers as well as answering users.

The “Negative Reason” classification is also used in relation to sentiment scores with the intention of revealing which type of posts that were qualitatively classified as negative have the lowest sentiment score, showing which issue is written about in the most negative way in either forum, adding insights into what is most disliked by Etsy sellers using the forums.

Negative Reason	Marketing Your Business	Average Quali.	Average Atlas.ti	Creative Process	Average Quali.	Average Atlas.ti
Copyright Violation	0	----	----	8	0.326	0.3815
Issue with Etsy	4	0.1834	0.2537	4	0.3163	0.302
Lack of Sales	32	0.407	0.4724	8	0.3071	0.4208
Technical Issue	8	0.3075	0.3775	7	0.3136	0.5334
Rant	0	----	----	3	0.3773	0.3158
None	66	0.555	0.4538	70	0.6008	0.5443
Total	100	0.473	0.4456	100	0.5163	0.5037

Table 25: Negative Reasons with Average Sentiment Score for Both Forums.

It is therefore possible to see which issues users are most negative about, effectively showing what is the worst problem posting sellers have with Etsy in each forum. In both groups this would be “Issue with Etsy”, which is any issue with the site that does not come from a technical defect, along with “Technical Issue”. This signifies users are write about problems they encounter on the platform in the most negative way, more so than simply expressing frustration with a lack of sales. Another problem which stands out to sellers posting in “Creative Process” and has a negative sentiment score is “Copyright Violations”, which is also portrayed as a persistent issue which is encountered on the site.

II. Sentiment and Complexity: Answering Sellers

Moreover, it is necessary to use these sentiment scores and post complexity in relation to the posts characteristics to see if posts with a low sentiment score attract more or less likes and replies and if a complex post gets more likes and replies. This process can also be repeated with the “Relevant” post characteristic to determine which type of posts written by sellers are most interacted with by other sellers, revealing the preferences of answering sellers in both forums.

The next two tables are now the sentiment categories in relation to the external interactions from other sellers in each discussion board. It will answer whether answering sellers prefer interacting with positive, neutral, or negative posts in their respective forums. For this process, instead of needing to make two distinct tables for both coding methods, this new sentiment score is now the average between both sentiment scores: the qualitative and automatically coded (Atlas.ti) values. A “Comprehensive” sentiment score which keeps ensuring a degree of intercoder reliability through its results. These indicate that Negative posts do generally get less likes and replies than neutral or positive ones, although this effect is more pronounced in the “Creative Process” forum, where posts with a positive sentiment score get considerably higher levels of likes and replies. In “Marketing Your Business”, there is a difference in engagement from answering sellers between negative and neutral posts, but none in terms of replies for positive posts, they are even shown not to get any likes on average. It is also worth mentioning that all types of posts get replies, showing that there is engagement for all type of posts. Preferences vary considerably from one forum to another.

Comprehensive Sentiment Score	Score Category	Count	Category Count	Averg. Likes	Average Category Likes	Averg. Replies	Average Category Replies
Negative	0-0.1	3	36	0	0.2222	1.6666	5.9444
	0.1-0.2	5		0		5.2	
	0.2-0.3	10		0.4		4.8	
	0.3-0.4	18		0.2222		7.5	
Neutral	0.4-0.5	24	52	0.2916	0.3653	9.9583	7.7115
	0.5-0.6	20		0.1		5.85	
	0.6-0.7	8		1.25		5.625	
Positive	0.7-0.8	9	12	0	0	6.7777	6.75
	0.8-0.9	3		0		6.6666	
	0.9-1	0		---		---	
	Total	100	100	0.27	0.27	6.96	6.96

Table 26: Post Like and Replies in Relation to Comprehensive Sentiment Score: Marketing Your Business.

Comprehensive Sentiment Score	Score Category	Count	Category Count	Averg. Likes	Average Category Likes	Averg. Replies	Average Category Replies
Negative	0-0.1	0	33	----	1.0303	----	10.6363
	0.1-0.2	2		1		7.5	
	0.2-0.3	12		1.9166		8.6666	
	0.3-0.4	19		0.4737		12.2105	
Neutral	0.4-0.5	16	50	0.3125	1.56	6.6875	12.82
	0.5-0.6	18		1.3333		6.1666	
	0.6-0.7	16		3.0625		26.4375	
Positive	0.7-0.8	9	17	0	3.4117	6.6666	20.294
	0.8-0.9	5		11.6		50.4	
	0.9-1	3		0		11	
Total		100	100	1.7	1.7	13.37	13.37

Table 27: Post Like and Replies in Relation to Comprehensive Sentiment Score: Creative Process.

Complexity Categories	Number of Post Functions	Count	Category Count	Average Likes	Average Category	Average Replies	Average Category
Simple	1	9	35	0	0.2571	6.4444	6.9714
	2	26		0.3461		7.1538	
Moderate Complexity	3	24	47	0.1666	0.2124	7.4166	5.7446
	4	23		0.2608		4	
Complex	5	10	15	0	0.2666	6.6	7.3333
	6	5		0.8		8.8	
High Complexity	7	2	3	1.5	1.3333	26.5	24
	8	1		1		19	
Total		3.27	100	0.27	0.27	6.96	6.96

Table 28: Post Likes and Replies in Relation to Post Complexity: Marketing Your Business.

Complexity Categories	Number of Post Functions	Count	Category Count	Average Likes	Average Category	Average Replies	Average Category
Simple	1	11	35	0.0909	0.9999	3	10.8857
	2	24		1.4166		14.5	
Moderate Complexity	3	37	56	1.2432	2.3928	8.7567	15.3392
	4	19		4.6315		28.1579	
Complex	5	7	9	0.1428	0.111	9.8571	10.7777
	6	2		0		14	
High Complexity	7	0	0	---	----	----	----
	8	0		---		----	
Total		3.27		1.7	1.7	13.37	13.37

Table 29: Post Likes and Replies in Relation to Post Complexity: Creative Process.

The same process is repeated with the number of functions attributed to each post, otherwise referred to as post complexity. Results in “Marketing Your Business” indicate that there are higher rates of engagement in terms and likes and replies from other sellers for more complicated posts, showing that answering sellers prefer detailed and intricate posts. However, this is not the case in “Creative Process”, where “Complex” posts receive less engagement. In this forum, it is “Simple” and “Moderate Complexity” posts which receive more engagement. This highlights once again how engagement preferences shift from one Etsy forum to another.

C) Seller Characteristics in Relation to Interactions

I. Type of Forum Solicited

The next section of this study focusses on the characteristics of sellers using both forums, to determine which type of engagement is made by which type of seller. These attributes have been previously described as both values which relate to time on the site as an Etsy seller and the last visit, including his rate of interaction with other posts, and his shop statistics: his number of items, admirers, sales, and the number of channels he has advertised on his shop page. These continuous variables will be compared between both forums to reveal the differences between sellers which post in both forums.

The first variable to analyse the number of days since the average posting seller from each forum registered as a member. Despite having similar max, median, modal values and standard deviation, the median of “Creative Process” is significantly larger, indicating that sellers posting there have been members for a longer period of time than in “Marketing Your Business”. Values which indicate a user’s interaction rate such as “Likes Given or Received, Solutions and Posts” are mitigated. For Posts, median and mode are very similar, yet the mean of “Creative Process” is significantly higher. This can be explained due to its max and standard deviation which are both twice as high as in “Marketing Your Business”. The same can be said about the “Likes Received” and “Likes Given” variable, with either forum that has the largest maximum, having the largest mean and median. Next the “Last Visit” category reveals that because both forums have similar means and the median of “Creative Process” is higher, this implies again that a larger number of accounts have last connected themselves a longer time ago, however it is important to take note of the sample limitation and realise that there is in fact no significant divergence. Moreover, shop statistics are very similar between both forums for “Items” and “Admirers”, despite “Marketing your business” having a considerably lower mean and max. Thus, it could imply that sellers in that forum have more slightly more Items listed in their shop but cannot be conclusive. For the “Shop” variable, it appears sellers in “Creative Process” register more sales, but because the maximum is so much higher this also cannot be conclusive. Finally, the number of external sales channels listed in the sellers about section is higher in “Marketing Your Business”, because all values except for the mean and median are the same. Hence, the two conclusive values taken from this comparative analysis are that sellers in “Creative Process” are registered for a longer period of time and that those posting in “Marketing Your Business” display more external channels on their shop. Thus, sellers with more time spent on Etsy may consult the former and newer sellers, trying marketing tactics on their shop site post in the latter.

	Member Since	Posts	Solutions	Likes Received	Likes Given	Last Visit	Items	Admirers	Sales	5 Channels
Min	1	1	0	0	0	0	0	0	0	0
Max	3854	42899	630	17583	7582	107	640	7070	7990	5
Mean	756.15	610.16	7.03	286.81	126.05	41.13	65.29	327.65	546.42	1.27
Median	244.5	11.5	0	3	4	38	32.5	22.5	31.5	1
Mode	104	1	0	0	0	0	0	0	0	0
Standard Deviation	1117.0267	4350.81	62.9929	1795.08	778.235	34.4846	110.09	1008.49	1467.64	1.48973

Table 30: Seller and Shop Characteristics from the Forum Marketing Your Business.

	Member Since	Posts	Solutions	Likes Received	Likes Given	Last Visit	Items	Admirers	Sales	5 Channels
Min	9	1	0	0	0	0	0	0	0	0
Max	3926	83435	173	5433	15939	143	2564	11505	30907	5
Mean	1174.54	1582	3.99	257.06	243.1	40.7	108	585.73	1382.49	0.88
Median	278	9	0	1	2.5	25.5	38	21.5	51	0
Mode	3895	1	0	0	0	0	0	0	0	0
Standard Deviation	1424.693	8750	18.5508	832.52	1618	41.81766	290	1651.1	4437.6	1.1183

Table 31: Seller and Shop Characteristics from the Forum Creative Process.

It is now necessary to compare both forums using the binary values established in the methodology section to investigate these differences between forums further. These variables are whether the seller lists an about section on his shop, the 5 main channels listed in the about section if he does custom orders and if his account is active or not. This will in part be done to show further show how users on “Marketing Your Business” have a higher propensity to list their social media accounts or personal website on their Etsy shop.

	About		Instagram		Twitter		Facebook		Pinterest		Pers. Web.		Custom		Active	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Marketing Your Business	71	29	42	58	13	87	27	73	25	75	21	79	25	75	91	9
Creative Process	69	31	32	68	7	93	21	79	13	87	14	86	36	64	88	12
Total Sample	140	60	74	126	20	180	48	152	38	162	35	165	61	139	179	21

Table 32: Binary Seller Characteristics in Both Forums and Total Sample.

Both forums have a similar number of sellers which have an about section displayed on their shops page and who have active shops with at least one item in it. However, for each social media channel listed, “Marketing Your Business” continuously has more sellers displaying them on their shop page. This confirms the previous deduction, that users of this forum are more likely to use marketing techniques on their shops, therefore putting other pages on display for potential buyers to interact with. However, more users in “Creative Business” offer the possibility to make customised goods for their customers and put a special button on their shop page to address their query to them. Thus, differences between different forum users are that those in “Marketing Your Business” list more social media and personal channels, indicating an increased marketing savviness. Whereas sellers posting in “Creative Process” are more likely to offer unique customised goods to customers, showcasing an increased creativity in their product finalisation. It is therefore possible see what characteristics define the users of distinct forums.

II. Topics in Relation to Seller and Shop Characteristics

In this final stage of analysis, it is now important to investigate how seller characteristics determine what kind of engagement is made. Whether variables such as shop experience are related to what kind of topics are addressed, the whole sample is therefore divided into each topic “Main Category”, which will be shown in relation to the average shop characteristics sellers posting about that topic have. This is intended to highlight how certain seller characteristics affect the type of engagement that is made on Etsy forums in general.

Topic Main Category	Days Since	Av. Posts	Av. Solution	Likes Given	Likes Received	Last Visit	Items	Admirers	Sales	5 Channels
Anecdote	2180.3	832	8.1666	56.166	344	3	109.666	779.66	2157.16	1.1666
Community	1341.1	2274.87	39.435	1198.8	1345.65	22.304	98.522	574.6	1866.87	0.826
Copyright Infringement	715.36	7.1818	0.0909	3.4545	3	46.9	282.273	711.454	5013.9	0.8181
Feedback	337.35	42.5	0.0714	11	4.857	49.28	20.5	45	17	1.0714
Marketing	577.54	267.459	0.5135	20.162	95.7567	40.648	77.838	147.891	467.054	1.432
Personal Intro	75.4	1.6	0	0.4	0	59.2	22.6	12.6	238.8	0
Production Recommend	1503	3783.321	1.7857	112.28	360.056	49.2857	81.07	458.571	795.93	0.9285
Sales	457.66	29.2727	0.0303	11.666	7.1818	45.7272	32.25	223.939	121.333	0.879
Site Info	1355.8	197.931	1.607	128.46	123.535	45.1725	103.074	643.127	970.586	1.1724
Social Media	1454.4	1114.9	0.3	75.1	298.8	30	116.5	503.9	319.1	1.5
Technical Issue	1838.5	6883	6.5	47.25	241	36.75	114.25	3592.5	1379	1.75
Total	983.34	1096.06	5.5377	185.5	273.301	40.915	86.375	450.88	964.455	1.07

Table 33: Forum topics in relation to Seller and Shop Characteristics for the Total Sample III. Type of Engagement Made:

The table above gives average characteristics for each forum topics “Main Category”. The first of these is the number of days since which the seller joined the platform. It is possible to see several topics which have an average over thousand days, such as: “Community”, “Anecdote”, “Production Recommendation”, “Site Info” and “Social Media”. Etsy members with more than three years experience as a seller are more likely to write about these topics. Inversely, new members will write about the other topics. Sellers posting in the “Community” topics category have a considerably higher forum interaction rate with “Posts”, “Solutions” and “Likes”. On the lower end, sellers posting topics such as “Sales”, “Personal Intro”, or “Marketing” show less forum interactions. This shows how members posting community-oriented posts are more likely to have experience on the site whilst newcomers with limited experience on Esty ask for sales and marketing orientated advice. Another category which confirms this statement is “Production Recommendation”, which also has higher interaction forum interactions than these kinds of topics, again showing how members asking other for advice about creative processes have more experience than those looking to sell. In terms of sellers visiting the site last, the community topics have sellers logging in closer to the sample date, confirming the assumption that they are more engaged on the site, visiting their shop frequently as well as posting more often. Although the data is limited by the fact that the latest sampled post in either forum are at a different date.

Shop characteristics involve data taken from the seller’s shop page such as number of items, shop followers and sales. Once again, the newcomer topics discern themselves as “Sales”, “Personal Intro”, “Feedback” and to some extent “Marketing”. However, post categories topics such as “Social Media”, “Site Info” or “Production Recommendation” show sellers having a shop which is more developed in terms of items, sales and following than the aforementioned newcomer posts. Still the Community section tends to outperform others, although “Copyright Infringement” although presented as newer members with lower social credentials, they have developed shop statistics. The topics mentioned previously as newcomer are still shown as having a lower shop activity. Results are consistent between seller profile and shop characteristics. Finally, the users who have the most social media channels listed are logically those that post in the “Marketing” topic category, along with “Social Media” and “Technical Issue”. This time, seller that post “Community” entries have a lower score, same with creativity oriented “Production Recommendation” and “Creative Process” topic “Copyright Infringement”, showing how the sellers which post in this group are less inclined to engage in marketing tactics. This analysis has revealed how sellers posting about different topics have certain common characteristics, with some topics being addressed by newer users other by more “mature” sellers. Different types of sellers interact with the two forums and characteristics can reveal not only the type of forum they write in, but also the topic they are more likely to post about. This analysis can also be supplemented with a table showcasing the binary variables taken from the shop page, although the different social media channels can be omitted as the “5 Channels” value is detailed enough.

Topic Main Category	Account Active		Custom Order		About Section	
	Yes	No	Yes	No	Yes	No
Anecdote	5	1	2	4	5	1
Community	23	0	7	16	18	5
Copyright Infringement	10	1	5	6	7	4
Feedback	12	2	5	9	10	4
Marketing	35	2	11	26	28	9
Personal Intro	4	1	1	4	0	5
Production Recommend	23	5	8	20	19	9
Sales	28	5	7	26	22	11
Site Info	29	4	9	20	21	8
Social Media	10	0	5	5	7	3
Technical Issue	4	0	1	3	3	1
Total	79	21	61	139	140	60

Table 34: Topic Main Category for Shop Page Binary Value

The table above displays binary values extracted from the posting sellers shop page. They showcase the topic that is posted about where sellers are most likely to deactivate their account before sampling took place. These reveal themselves to be “Sales”, “Site Info” and “Production Recommendation”. There 8 inactive users were from “Marketing Your Business”, the majority of which abandoned their shop after asking for sales advice. Sellers most likely to include the “Custom Order” button are those posting in “Community”, “Copyright Infringement” and “Production Recommendation”, those posting in “Creative Process”. Once again, showcasing their increased creativity. Whereas for sales topics, sellers posting newcomer topics such as “Sales” and “Marketing” tend not to include a “Custom Order” button on their

shop page, but other topics such as “Social Media” and “Site Info” have higher rates. Splitting the marketing topics into two categories, for new sellers and more experienced ones. This is replicated in the “About Section” category. As usual community focussed categories such as “Anecdote”, “Community”, “Production Recommendation” have a high tendency to include an “About Section” which is used to describe their creative process. Once again, “Sales” and “Personal Intro” has a low score, but this time “Marketing”, “Site Info” and “Feedback” categories have higher rates of users including this feature on their shop page, indicating their willingness to engage in marketing practices and increase their knowledge on the site. Thus, results between both the continuous and binary values indicate that the topics addressed by sellers are related to their seller and shop characteristics.³

III. Sentiment in Relation to Seller and Shop Characteristics.

Now that the topic “Main Categories” have been addressed in relation to seller and online shop characteristics, this analysis can continue by using these values and testing the relationship between them and the comprehensive sentiment score. This is done in order to see which users tend to post in a negative or complex manner. A multivariate analysis was carried out, comparing sentiment, seller, and shop characteristics with one another. This is the final step in studying how seller characteristics may determine the sentiment of a post in Etsy forums and the logical next step after analysing these continuous variables in relation to post topic “Main Categories”. This multivariate analysis revealed the correlation coefficients between each pair of variables. If these are close to one, then they can be considered as having a positive relationship between one another. Conversely, a coefficient close to -1 indicates a negative relationship. Because all variables except for the sentiment score and the number of channels displayed outliers, observations which extended far beyond the median, a second correlation matrix was created by obtaining the logarithmic value of each variable⁴. Both correlation matrices can be found under “Appendix J”.

The aim was to outline a positive or negative relationship between the comprehensive sentiment score and one or more of the user’s seller and shop characteristics. However, with no negative relationships witnessed, the only noteworthy positive correlations with coefficients above 0.6 were obvious relationships that exist on the site such as the time spent registered as a seller with the number of posts made and admirers, the number of posts made with the quantity of likes received and the number of sales and items with admirers. These interrelations represent the functioning of forums, it is obvious that someone with more time on the site tends to write more posts and command a larger following, that more posts will imply a greater tendency to receive likes and that higher quantities of admirers imply that the seller has sold more. Less clear is the fact that there is a positive relationship between sales and the number of items displayed on the shop page, although not relevant to this investigation. No positive or negative relationships could be determined between the comprehensive sentiment score and one of the aforementioned variables, implying that there is no direct relation between post sentiment and the seller’s overall characteristics.

Moreover, using the weighted averages of seller and shop attributes for each sentiment categories, a bivariate analysis can also be conducted with the intention of reinforcing these findings. Although determining a correlation is not possible, results from this binary inquiry indicate the possibility of several relationships between sentiment category with seller and shop characteristics. For example, regarding

³ One of the variables from Table 42: “5 Channels” is an ordinal value, it is an aggregation of each of the 5 most probable social medias to be included by the seller in his “About Section”.

⁴ This omitted all null values from the sample as $\log 0 = \infty$.

time as a registered seller, those that post positive posts are considerably newer members on average than those that write negative or neutral entries. In regard to forum activity, sellers that write in a positive tone have posted significantly less and received less likes on average than those writing in a negative or neutral tone, although the same cannot be said for likes given were positive and negative categories have the same value. Finally, a negative relationship between sentiment and shop characteristic can be witnessed. With sellers that have a higher number of sales, displayed items and admirers posting in a negative tone, added to the fact that values decrease between sentiment score categories. The same can also be said for the number of channels displayed on the shop page. Although not fully conclusive, findings indicate that more experienced Etsy sellers with a developed shop are more likely to write an entry categorised by a negative sentiment. This corresponds to the idea that as experience on the platform increases, opportunities diminish for sellers (Cutolo and Kenney, 2019). Hence, this reduced sales potential for older sellers may be illustrated by the tendency to write negative posts in Etsy forums. Despite not being supported by a multivariate correlation analysis, a negative relationship between shop characteristics, along with the time registered a seller and the comprehensive sentiment score has been presented.

Compr. Sent. Score	Score Cat.	Cat. Count	Av. Days Since	Av. Last Visit	Av. Post	Av. Likes Recei.	Av. Likes Given	Av. Num. Sales	Av. Admi.	Av. Num. Items	Av. Out of 5
Negative	0-0.1	69	978.521	36.956	736.189	153.942	44.84	1187.16	606.536	99.246	1.333
	0.1-0.2										
	0.2-0.3										
	0.3-0.4										
Neutral	0.4-0.5	102	1027.54	43.911	1615.28	414.955	318.486	908.225	370.657	84.243	1.049
	0.5-0.6										
	0.6-0.7										
Positive	0.7-0.8	29	715.241	39.8	126.07	51.586	47.011	632.344	362.69	61.999	0.5172
	0.8-0.9										
	0.9-1										
	Total	100	965.345	40.915	1096.06	273.301	185.507	964.455	450.88	86.375	1.07

Table 35: Comprehensive Sentiment Score Categories in Relation to Seller and Shop Characteristics.

5) Conclusion, Implications and Limitations

A) Conclusion

By sampling posts from the two distinct Etsy forums “Marketing Your Business” and “Creative Process”, the initial aim of this study was to outline how different online communities materialise within e-commerce platforms, notably for those dedicated to small scale independent entrepreneurs selling self-produced goods. A comparative analysis was first done to investigate differences in engagement and interactions between the two discussion boards, initially establishing that “Marketing Your Business” received considerably higher levels of engagement in terms of post volume. This can be used to demonstrate that Etsy sellers consult forums more often for advice relative to sales and marketing rather than creativity, illustrating that overall priority of platform users is sales orientated. Next, an adapted version of Bales (1950) “Interaction Process Analysis” was used as a basis for a content analysis and revealed that queries were outlined in a similar manner between both forums. The number of different content functions attributed to entries was then used as an indicator of complexity, posts in “Marketing Your Business” can be considered more intricate on average, showing how users tend to write more detailed posts when asking for sales and marketing advice. Although posts in “Creative Process” were shown to be more descriptive in nature rather than inquisitive, requests for knowledge collaboration were comparable between both forums. When it came to emotive content, differences were more pronounced with sellers in the marketing forum more likely to show frustration and make jokes, whilst those in the creativity orientated discussion tending to be antagonistic towards suppliers and other members despite showing heightened levels of community solidarity. Differences in post intricacy and emotive content could therefore be witnessed, whilst posts in both forums followed certain common standards. Relative to Preece’s (2001) framework, components of the sociability category were shown to diverge and be continuous across both forums. The difference in emotive content highlighting the need for a further sentiment analysis.

Both an automatic and qualitative sentiment coding was carried out for a polarity analysis, aiming to cover Haven’s (2007) “intimacy” utilizing user generated data to determine a sentiment score. For qualitative coding, a specific process was made to include a separate category for positive posts aimed at the other sellers to account for Pi, Chou and Lia’s (2013) sharing culture and Preece’s (2001) interaction “policies” in the forum’s overall positivity. Although such sentences were more frequently coded in “Marketing Your Business”, the forum had less sentences coded as “Positive”, and the content analysis had already revealed less posts with community solidarity. Both coding processes revealed a clear difference in post sentiment, determining that “Creative Process” had more positive posts included in its sample whilst more negative posts were attributed to “Marketing Your Business”. Considering one group as sales and marketing orientated whilst the other is dedicated to community and creativity, it is safe to assume that the former’s users are more likely to write a negative post. A clear difference in sentiment was palpable, with the “intimacy” category of interactions being confirmed as changing between forums. Furthermore, the “involvement” category was scrutinized on behalf of answering sellers to investigate how external engagement with entries varied between forums. Results showed that posts in “Creative Process” received more likes and replies on average, but this could be equated with the difference in post volumes between both groups. The qualitatively assigned post topic categories were also analysed to finalize comparing interactions. Although some convergence was noted, posts in each group mostly focussed on distinct topics, with the same being witnessed for negative topics. This confirms that interactions differ between

discussion forums. Different social commerce systems are therefore established within Etsy forms, each with specific forms of knowledge collaboration.

Moreover, topics were examined in relation to the engagement they captured on behalf of other sellers. Within the whole sample, it was revealed that topics orientated at the community, rather than seeking some form of assistance would command heightened levels of engagement. This remained largely true in "Creative Process". Whilst in "Marketing Your Business", entries dedicated to marketing received the highest rates of participation. When it came to negative posts, each group also had distinct topics which engaged other users the most. Post sentiment and complexity was also addressed in relation to answering sellers. It revealed that answering sellers generally preferred interacting with posts that were classified as positive in "Creative Process" and neutral in "Marketing Your Business". Results differed even more in relation to post complexity, as simple posts were preferred in the creativity forum, whilst more intricate posts received higher rates of engagement in the marketing discussion board. This illustrates how users answering posts in each forum have distinct preferences, following Preece's (2001) framework once again, it could be understood that each forum encapsulates different policies which govern engagement between posts and replies. Focus was then turned to the sellers writing the posts in order to investigate what they valued the most, starting with which type of replies they were most likely to mark as resolved. It was determined that it was topics requiring definite answers, showing which interactions from answering sellers they valued the most. Furthermore, average sentiment scores were used to illustrate which topics were addressed in the most negative manner in each forum. Electronic word-to-mouth was therefore used to outline what users referred to in the most negative way on Etsy. Both forums outline different preoccupations, once again emphasizing how virtual communities change between given forums on a centralized e-commerce platform.

The final point of analysis that this study investigated was the seller characteristics, related to his interactions, commencing with the type of forum solicited. Conclusive differences established that members in "Creative Process" had been registered as sellers for a longer period of time, whilst sellers in "Marketing Your Business" had more external sales channels listed on their shop page. This indicates that older members have a higher propensity to visit the first forum, whilst sellers with a tendency to multi-home and employ more marketing tactics will post in the second. A similar process was conducted with further binary values and showed that members posting in "Creative Process" would be more likely to offer customized products, thus emphasizing the creative traits of its users. This procedure is then repeated with the whole sample, this time in relation to forum topics. It was thereby possible to elucidate which topics were addressed by older and newer members, which topics saw users with higher rates of past engagement with forums. The logic that senior members would write posts oriented at the Etsy community and new members would ask for advice was once again confirmed, with the same being shown for sellers asking for creative advice. Likewise, the use shop characteristics revealed certain topics for established sellers and new sellers, although marketing topics were split between novice and more experienced users. Finally, binary values confirmed that users posting about creative topics were more likely to offer customizable products and have an about section on their profile to describe their work, whilst those writing marketing topics had more social media channels listed on their shop page. The use of seller characteristics has therefore shown how online communities on Etsy distribute themselves between forums and how certain attributes may influence which topics they will post about.

B) Implications

By focussing on the posts in two different forums in Etsy, this paper has used a range of past research and theories to provide a framework for analysing online discussion boards in e-commerce platforms. A large volume of readily available data can easily be collected and analysed to determine how online communities materialise and operate within different forums of the same platform. The two sampled forums were meant to illustrate two different objectives: increasing sales and learning new creative processes. An initial comparative analysis showcased how interaction changes within the premises of those two distinct forums, demonstrating how tone and content may change in relation to the forums stated goals. By using topics, complexity, and sentiment in relation to exterior engagement, the forums showed how members engaged one another within the discussion boards and what answering sellers would prioritise, effectively showcasing how each given forum has a unique functioning with its own set of values and code of conduct. Furthermore, using both a comparative and a cross-sectional analysis this paper also presented how user attributes have an influence on not only the type of forum that is solicited but also the topic that is addressed. This paper therefore not only addressed the ways forums operated differently, but how certain topics attract certain types of sellers. Further research should investigate Etsy or another e-commerce platform with forums at user's disposal to see how different discussion board goals command different interaction and engagement outcomes, whilst also analysing seller characteristics on the site in relation to how they interact and what they post about. As distinct online communities exist within each forum, it is necessary to understand them to build a picture of the different types of users that are registered to the platform. This study has therefore revealed several insights which can be used in further research: interaction shifts between forums on e-commerce platforms, with different topics and writing styles being privileged by answering users. Online word-to-mouth can be used to outline the different priorities that forum users may have, highlighting the different issues connected to the sales platform. Finally, the characteristics of users have an influence on what topic is addressed.

C) Limitations

Throughout the study, two main limitations have been pointed out. The first being a lack of intercoder agreement for the content analysis and differing dates for the latest post of each forum sample. Further limitations would include a lack of scope and scale, as sampled data was extracted manually, this was a slow and time-consuming process. This paper sought to show how online forums operate distinctly from one another on Etsy, which only accounted for two out of the nine discussion boards. This study can easily be replicated on more forums, and it would be interesting to increase knowledge relative to Etsy online word-of-mouth. The platform Etsy is also very particular, being the biggest of its kind. It would be interesting to investigate whether a similar study could be done for other forums or digital platforms. This study has shown how to manually mine and code data extracted from Etsy forums, with limited technological programming. Although it provided a way of analysing and interpreting user profile and satisfaction, it would need to be replicated on a much larger scale to represent the perfect picture of different virtual communities on Etsy. Finally, as much as this study attempted to collect data in detail, many aspects of Etsy forums were left out. Such as analysing the post replies. These would have revealed that many users posting onto forums had shops that were selling items that were not handmade and vintage. Therefore not “Etsy legal”. The shop has grown rapidly and is detracting from its original communitarian aspect. New coming sellers who post one time attempting to sell factory made, or bundled goods would post, only to be told they could not sell these items on Etsy. Finally, to conclude this list of limitations, it is also necessary to highlight the fact that the majority of research conducted in this study was a binary analysis. Further research could use these same variables in a multivariate study in order to investigate the same relationships covered in this paper.

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7) Appendix

A: Description of the 9 Etsy Forums.

The 9 different forums are named and described as follows*:

-Managing Your Shop: Everything related to the seller's shop and its organisation, topics cover listings, shop modifications and growth and any other issue concerning the user's personal marketplace.

-Photography Tips: Topics concerning item photography for the seller's listings.

-All Things Finance: Financial strategies for pricing, receiving payments, platform fees and tax advice.

-Marketing Your Business: Anything concerning the shops visibility and traffic. How a user's shop can be presented in order to attract as many customers as possible.

-Providing Great Customer Service: Sellers share advice and discuss potential issues involving B2C relationships and interaction.

-All About Shipping: Made to exchange ideas and address problems relating to product shipment

-Shop Critique: A space where sellers can receive feedback about their shop from others, allowing them to improve their space in the process.

-Technical Issues: Sellers can communicate any potential technical shortcomings and receive potential solutions from others.

-Creative Process: This forum is dedicated to sellers asking for recommendations about production processes, materials, or tools and to share their personal creations.

*Note that two other forums are accessible to sellers, but posting is reserved to Etsy admin employees (Community Specialists) and established sellers.

-**Announcements:** Strictly for community specialists to share news, updates, and new features.

-**Etsy Success:** Posts are written by Community Specialists and established sellers, information is intended to help newcomers establish themselves, Q&A's take place within the replies.

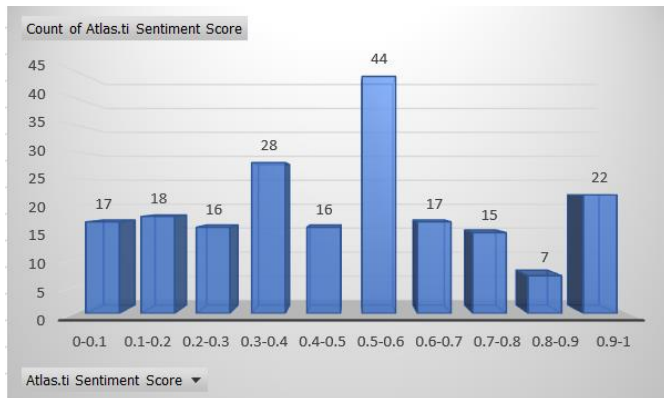
B1: Negative Reason Count and Description.

Negative Reason	Count	Description
Copyright Violation	8	Issues related to copyright, the seller may be infringing on someone else's copyright for a given item or vice-versa.
Issue with Etsy	8	Seller has a problem with one of Etsy's features, without there being a persistent technical issue.
Lack of Sales	40	Seller complains about his shop not living up to his expectations in terms of sales and traffic.
Technical Issue	15	Issues related to the functioning of the platform.
Rant	3	A vent post, ranting about other sellers, social media, or suppliers.
Total	74	A total of 37% of posts have been subjectively classified as negative

B2: Topic Main Category Topic Count and Description from Total Sample.

Post Category	Post Count	Description
Anecdote	6	Poster recalls a story or personal experience
Community	23	Designed to help or engage other sellers on the Etsy forums community, often directly giving or asking for ideas, experiences, and suggestions in a trivial manner.
Copyright Infringement	11	6 a. Seller: The seller is accused of copyright infringement or just asking for clarifications.
		5 b. Other Seller: The seller is a victim of copyright infringement and asking for advice.
Feedback	14	Seller directly asks other members of the community to view his shop and comment.
Marketing	37	Entries which relate directly to marketing techniques to increase visibility and traffic.
Personal Intro	5	An entry is written by the seller to introduce himself and his shop to the community
Production Recommendation	28	Seller asks for advice about a production tool, material, or supplier.
Sales	33	Asking the wider community how to increase sales.
Site Info	29	Written to obtain clarifications about the site's rules and usage.
Social Media	10	Relating to using social media in combination with Etsy.
Technical Issue	4	Posts asking for a possible solution to a site malfunction.
Total Posts	200	

C: Atlas.ti Sentiment Score Distribution Chart with Score Categories Count and Percentage from Total Sample.



Sentiment	Score Category	Atlas.ti Count	% of Sample
Negative 79 (39.5%)	0-0.1	17	8.5
	0.1-0.2	18	9
	0.2-0.3	16	8
	0.3-0.4	28	14
Neutral 77 (38.5%)	0.4-0.5	16	8
	0.5-0.6	44	22
	0.6-0.7	17	8.5
	0.7-0.8	15	7.5
Positive 44 (22%)	0.8-0.9	7	3.5
	0.9-1	22	11
	Total	200	100

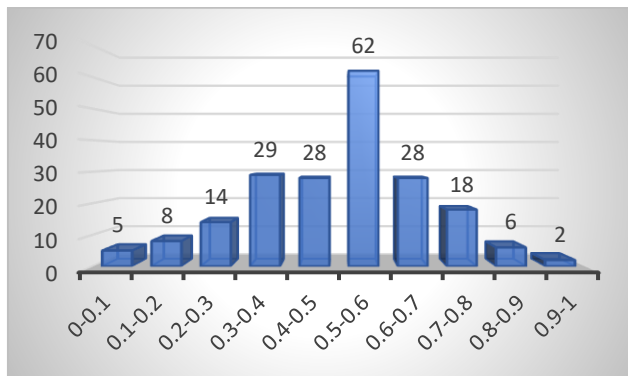
D: Interaction Process Analysis Classification Method for Etsy Forum Posts.

1.	Social Emotional	Positive	Shows solidarity (raises other's status, gives help).	These posts contain positive elements in regard to community interaction, by soliciting other members in a positive way or giving help directly in the post. <u>Ex:</u> "Hi Friends!" "I hope everyone enjoys their successes"
2.			Shows tension release (jokes, laughs, shows satisfaction).	Highlights the posters overall positivity, supplemented by internet vernacular or emotive language. <u>Ex:</u> "I thought I'd do a procrastination post rather than get on with my work" "LOL"
3.			Agrees (shows passive acceptance, understands).	Threads which reference other posters to agree with them. <u>Ex:</u> "I came across someone asking this question (...) it is something I've privately wondered if I should start doing"
4.		Negative	Disagrees (shows passive rejection).	Post referencing other threads to disagree with them. <u>Ex:</u> "Sacrificing quality is NOT acceptable and I am shocked and appalled that they could suggest and expect anything less!"
5.			Show's tension (expresses issue/difficulties)	Personal frustration and negativity expressed in regard to activity on Etsy. <u>Ex:</u> "WOW...this has been our slowest month to date!"
6.			Show's antagonism (deflates other's status).	Speaks of service or fellow user negatively. <u>Ex:</u> "I just received this message from "Kids2, Inc." (Let me start off by saying I've NEVER heard of this company in my life.."
7.(1)	Task Area	Questions	Asks for orientation (general info).	Intended for general information to be provided about a given topic. <u>Ex:</u> "If I create a coupon, when does it expire?"
7.(2)			Asks for personal information (direct address)	General info requested is based on personal experience. <u>Ex:</u> "Does anyone else have this issue?" "Do you have such experience, who does it and got a justified result?"
8.			Asks for opinion (evaluation, analysis)	Opinions from other users requested in order to understand perception of other sellers. <u>Ex:</u> "Just wondering how many of you would buy pretty printed bubble wrap film if that was an option..?"
9.			Asks for suggestion (possible way of action/suggestion)	Questions that entail possible solutions to a given problem. <u>Ex:</u> "I would like to hear about your suggestions" "Do you have any advice for me?"
10.		Attempted Answers.	Gives suggestion (clarification, extra details)	Posters give suggestions which help guide future replies in order to provide accurate answers. <u>Ex:</u> "When I follow the instructions to Create a new team I get to the page but there's no Create Team button"
11.			Gives opinion (evaluation, analysis).	The user gives a specific opinion about what he would like to achieve through his post. <u>Ex:</u> "Hello all, im looking to start printing bookmarks to add to my collection of goodies on my store."
12.	Gives orientation (information, repeats, clarifies).		Provides other sellers general information about him and his shop. <u>Ex:</u> "Hi! I'm new to Etsy, but I've been running my small business for about a year now."	

E: Qualitative Sentiment Code Definition with Examples.

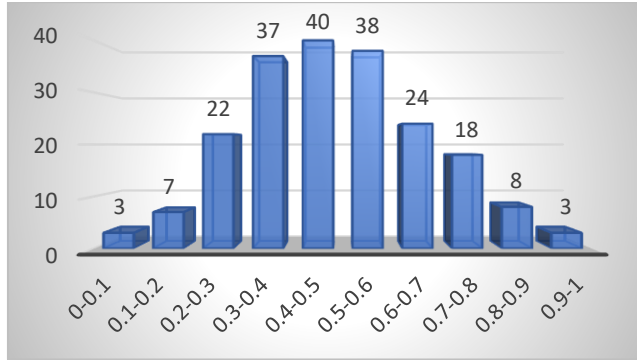
Qualitative Sentiment Code	Definition	Example
Negative	Shows direct signs of frustration about not managing to use site to fulfil expectations	“I got this email this morning and I have no clue what I did wrong” “But I don’t understand why I have no sales? (“
Neutral	Purely factual, without any emotions being expressed, no emotive behaviour.	“I need suggestions how to repair it to sell it.” “Do you post daily on all social media like Facebook or Instagram”
Positive	Praises an aspect of Etsy or his experience on the site, in relation to personal feelings.	“Every time I scroll through the Etsy marketplace I feel so inspired by how many creatives are here”
Positive Community	Community interaction which is acknowledges other sellers in a warm and friendly manner.	“Any feedback is much appreciated!” “Any help on how to best market this so I can get more views and come up in searches would be greatly appreciated!!”

F: Qualitative Sentiment Score Distribution Chart with Score Categories Count and Percentage from Total Sample.



Sentiment	Score Category	Quali. Count	% of Sample
Negative 56 (28%)	0-0.1	5	2.5
	0.1-0.2	8	4
	0.2-0.3	14	7
	0.3-0.4	29	14.5
Neutral 118 (59%)	0.4-0.5	28	14
	0.5-0.6	62	31
	0.6-0.7	28	14
Positive 26 (13%)	0.7-0.8	18	9
	0.8-0.9	6	3
	0.9-1	2	1
200	Total	200	100

G: Comprehensive Sentiment Score Distribution Chart with Score Categories Count and Percentage from Total Sample.



Sentiment	Score Category	Comp. Count	% of Sample
Negative 56 (34.5%)	0-0.1	3	1.5
	0.1-0.2	7	3.5
	0.2-0.3	22	11
	0.3-0.4	37	18.5
Neutral 118 (51%)	0.4-0.5	40	20
	0.5-0.6	38	19
	0.6-0.7	24	12
Positive 26 (14.5%)	0.7-0.8	18	9
	0.8-0.9	8	4
	0.9-1	3	1.5
200	Total	200	100

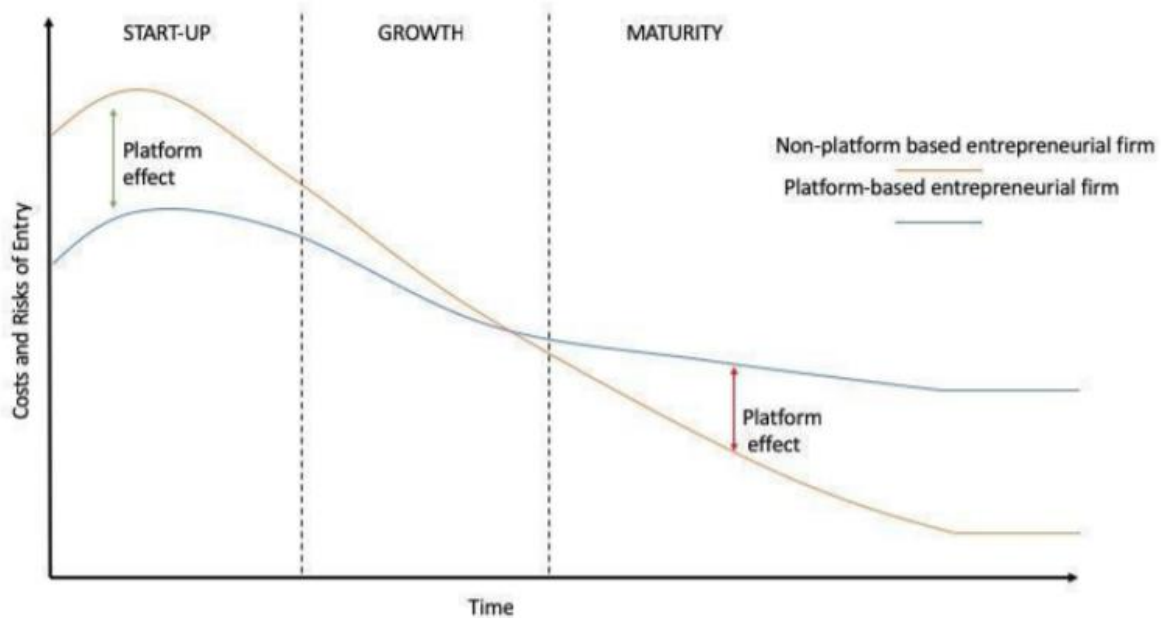
H1: Average Amount of Functions per Post by Sentiment Score for “Marketing Your Business”, All Sentiment Scores.

Sentiment	Score Category	Avrg. Funct. Quali.	Funct. Per Categ.	Av. Funct. Atlas.ti	Funct. Per Categ.	Comp. Senti. Score	Funct. Per Categ.
Negative	0-0.1	2.3333	3.6	2.3	3.3809	2.3333	3.388
	0.1-0.2	4.3333		3.7777		3.4	
	0.2-0.3	3.5714		3.9091		3.3	
	0.3-0.4	3.706		3.5		3.6111	
Neutral	0.4-0.5	4.0588	3.1611	4	3.5263	3.5833	3.4038
	0.5-0.6	2.7056		3.125		3.45	
	0.6-0.7	3.1818		4.6		2.75	
Positive	0.7-0.8	2.8333	2.875	2.9	2.55	2.3333	2.3333
	0.8-0.9	3		2		2.3333	
	0.9-1	----		2.2222		----	
	Total	3.27	3.27	3.27	3.27	3.27	3.27

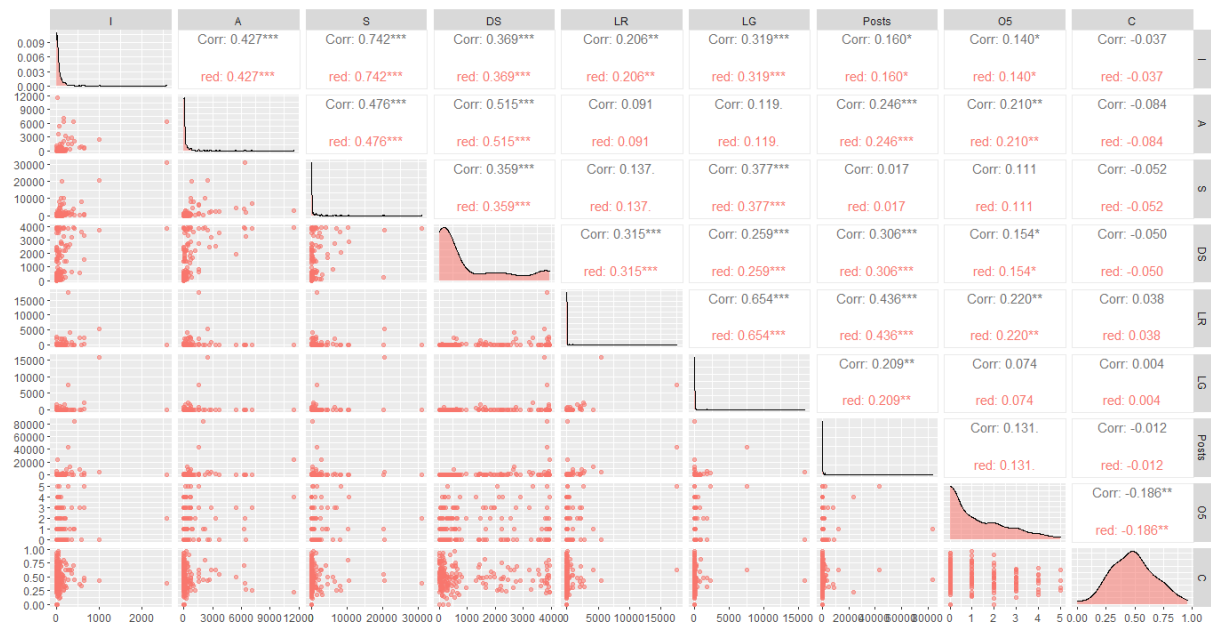
H2: Average Amount of Functions per Post by Sentiment Score for “Creative Process”, All Sentiment Scores.

Sentiment	Score Category	Avg. Funct. Quali.	Funct. Per Categ.	Av. Funct. Atlas.ti	Funct. Per Categ.	Comp. Senti. Score	Funct. Per Categ.
Negative	0-0.1	1	2.9615	2.857	3.0268	----	2.9697
	0.1-0.2	3.4		2.666		4	
	0.2-0.3	2.4285		2.8		2.5	
	0.3-0.4	3.4166		3.375		3.1579	
Neutral	0.4-0.5	3.3636	2.8215	3.571	2.9229	3.1875	2.9599
	0.5-0.6	2.143		2.6		2.3888	
	0.6-0.7	3.5882		3.083		3.375	
Positive	0.7-0.8	3.6666	3.2222	3.6	2.7915	2.5555	2.7646
	0.8-0.9	2.5		3.166		3.6	
	0.9-1	2		2.3077		2	
Total		2.93	2.93	2.93	2.93	2.93	2.93

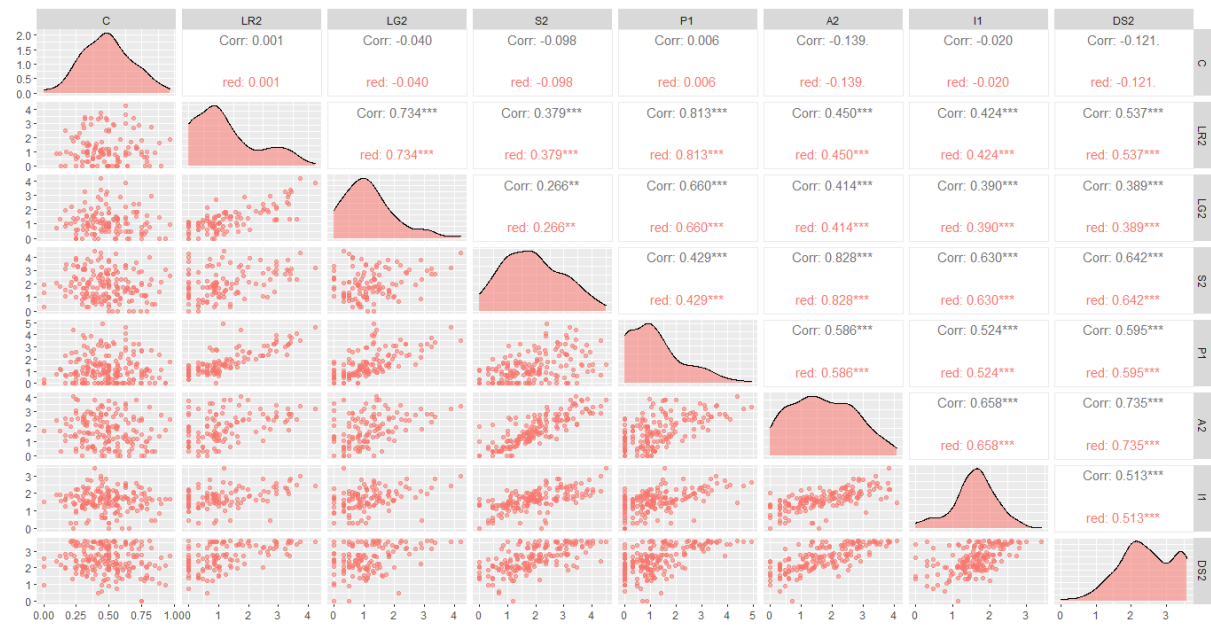
I: Cutolo and Kenney (2019), Erosion of Platform Benefits.



J1: Scatterplot and Correlation Matrix for Comprehensive Sentiment Score and Seller Characteristics



J2: Scatterplot and Correlation Matrix for Comprehensive Sentiment Score and Logarithmical Values of Seller Characteristics.



Legend: C= Comprehensive Sentiment Score I= Items A= Admirers S= Sales
 Ds= Days Since Registered as Etsy Seller Lr= Likes Received Lg= Likes Given
 O5= Out of 5 Channels I1= Log Items A2= Log Admirers S2= Log Sales
 Ds2= Log Days Since Registered as Etsy Seller LR2= Log Likes Received Lg2= Log Likes Given
 P1= Log Posts Posts= Posts