

A Rhetoric of Smart Carpet in the Age of Disruption

Leveraging IoT, Blockchain, and Platform for Value Co-Creation

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Abstract – The luxury goods industry has experienced evolving consumer preferences, emerged from innovation and growth in the sharing economy and driven by digital technologies. On one side, the sharing economy has disrupted traditional luxury brands by providing or sharing access to goods and services through online platforms. On another side, the entire value chain of luxury goods, from procuring raw materials, design and production, delivery, product co-creation, up to customer service, in-store experience, and even consumption are transformed by digital technologies. The purpose of this study is to explore the role of digital technologies including the Internet of Things (IoT), blockchain and platform models, to disrupt the luxury industry. This paper suggests a novel and practical framework to transform handmade carpet to smart carpet and co-create value with potential customers in order to build trust and influence their buying behavior. The framework illustrates, for the first time, how the unmatched power of a brand story can be leveraged and authenticated by digital technologies and through active contribution of customers.

Keywords–Smart Carpet; Luxury goods; The Sharing economy, Disruption; Digital technologies; Start-up; Brand Story; Co-creation; IoT; Blockchain; Platform models.

I. INTRODUCTION

Luxury products and services rely a great deal on brand intangibles and evoke a sense of myth and fascination. This is one of the reasons why the luxury sector grows faster than any other fields and thrives even during the challenging economic times. Considering all segments, the luxury market grew by 5% to an estimated €1.2 trillion globally in 2017, where sales of luxury cars continued to dominate the market by reaching €489 billion [1]. The value of worldwide personal luxury goods market—the "core of the core" is estimated to be €262 billion in 2017 with a heterogeneous group of 330 million individuals diversified by gender, cultural background, nationality, generation, attitude, and shopping behavior [1]. This huge market generated increasing interest in the luxury sector among both academics and practitioners [2][3] especially in the recent year with the advent of new trends and technologies.

On one side, the concept of sharing economy, which argues that the role of ownership is steadily being replaced by access, is gaining popularity and spreading among consumers, which ultimately redefines the luxury sector. The shift from "owning a luxury to just having access to it" is disrupting the luxury market and pushing brands beyond their traditional business models. The benefits of sharing platforms are lauded because of their possibilities to increase inter-

personal interaction and provide more sustainable and environmentally friendly options in the market [4][5]. On another side, the widespread adoption of electronic commerce and online platforms transformed the value proposition of luxury brands from the product-centric of value creation to one that focuses on the personalized and overall experience of the process in which brands, consumers, and the respective networks co-create a superior value proposition through the entire supply chain. This is very challenging and threatening for traditional luxury brands since they are not equipped to provide the same sensory atmospheric conditions as the offline purchase [6]. Even, most luxury marketers questionably considered the Internet as a mass-market, which push them to substantial discounting and this ultimately discourages them to embrace digital and online business [7]. The sharing economy and digital technologies have huge implications for luxury brands and how they can be marketed and managed. The proliferation of online platform business models, blockchain, and the Internet of Things (IoT) have heralded a digital transformation to serve as a catalyst of growth and enable individuals to share goods and services and even contribute in design, production, and consumption of them. The platforms build up commercially ecosystems of suppliers and consumers in which enormous amounts of value can be created and exchanged [8]. Blockchain and IoT can embed tractability and visibility by recording every event and transaction within a supply chain on a distributed ledger [9] in order to integrate transparency, fair trade, and sustainability.

This paper, therefore, aims to explore the impact of digital technologies on transforming the luxury sector through value co-creation. By examining the smart carpet as a case study, this research argues that co-creating a brand story can be nurtured by digital technologies which ultimately builds trust and influences the purchaser's intentions and willingness to pay a premium for the product. The rest of this paper is organized as follows. Section 2 reviews the sharing economy and digital disruption in the luxury sector. Section 3 is focused on co-creation concept and evolving preferences of customers. In Section 4, the smart carpet is examined as a case study and a practical framework is suggested to illustrate how the power of brand story can be leveraged by IoT, blockchain and platform model in order to build trust and influence consumers' buying behavior. Section 5 analyzes the framework to examine how successful it can be in the global marketplace. The final section summarizes the contributions and suggests further domain for research.

II. THE SHARING ECONOMY AND DIGITAL DISRUPTION IN LUXURY SECTOR

Rogers [10] suggests that the world of marketing is shifting from mass market to customer networks in which the core behavior of customers is focused on access, connect, engage, customize and collaborate. Kotler [11] describes how marketing has evolved from product-driven marketing (1.0) to customer-centric marketing (2.0) to human-centric marketing (3.0) and now value-driven marketing (4.0). The term “value” has received lots of attention especially from scholars and practitioners in marketing discipline and in its simplest definition means price. If we take more professional approach value refers to the buyer's existing benefits over what he or she paid for. These benefits or values can be of three types ; functional value – the value of a product's features and functions, the economic value – what the product benefits are worth in terms of time and money and finally emotional value – the psychological benefits that they get from buying, using, and owning products [12]. The latter is very important within the luxury sector as luxury customers are placing more emphasis on the emotional value, such as closeness and involvement with brands when making their purchase decisions [13][14].

The consumer preferences of emotional value and involvement within the luxury sector are now influenced by the sharing economy and digital technologies. The concept of sharing economy argues that the role of ownership is steadily being replaced by access and companies and consumers are less likely to exchange goods and service in markets [15] within the new era. As such, a growing number of consumers are engaging in access-based consumption, where consumers gain access to the products they seek, but no transfer of ownership takes place [16]. In this scenario, suppliers lease, rent or charge subscription or membership fee, and consumers just pay for the temporary experience or short-term use of goods and services [15][17]. With the advancement of information technology and widespread use of social media [18][19] the sharing economy enables people to collaboratively make use of under-utilized inventory through fee-based sharing activities on online platforms [20]. Today's prominent online peer-to-peer platforms including Uber (owns no taxi), Airbnb (owns no property) and Alibaba (owns no stock) which are driven by social relations as well as prices, facilitate the use of underutilized labor and assets and disrupt their relevant industry. Disruption is associated in part with “Disruptive Innovation Theory” coined by Clayton Christensen [21] and refers to the fact that companies are disrupted because of their success, that they are so invested in a wonderfully profitable way to extract the most money from product, and doing it so well, they allow new entrants to offer an inferior product or service which is cheaper and more accessible. As such incumbents never seek to explore ways to do things differently and become vulnerable to a new technology at a lower price point which moves up market, eventually displacing established competitors [21]. Williams [22] also argues that in some cases, threats to a company's business model come less from direct competitors than from high-impact innovation in a seemingly unrelated market. The

new technologies often enter at the bottom of the market which is ignored by established companies and then new ventures grow and beat the old systems from that point [22]. The tremendous success of the world's largest taxi firm (Uber), the world's largest provider of accommodation (Airbnb) and the world's largest retailer (Alibaba) testifies that they did not come from competitors in the same industry or even from companies with a similar business model. Rather all of them emerged from the sharing economy platforms as start-ups and forged by digital technologies and ultimately disrupted their respective industry. In line with these success stories, it is assumed that owning lots of things is going to be outdated in a fast-paced luxury sector and most of the resources are borrowed or outsourced in a transition from ownership to the sharing economy. In “The Digital Transformation Playbook” Rogers argues that disruption happens when an existing industry faces a challenger that offers greater value to the customers in a way that existing firms cannot compete with directly [23]. The five domains of digital transformation” described by Rogers [23] builds a solid foundation to explain how digitalization is reshaping customers, competition, data, innovation, and value domains. Table I sets out strategic themes and key concepts as businesses move from the analog era to the digital age. The first and most important domain is the customers. Digital technologies have transformed the whole customer expectation and experience. In fact, luxury goods and services are now sought, sampled, and purchased in very different ways than before and consumers expect competent e-commerce, engaging and exciting interactions on social media, and multiple channels for interaction. [24]. The customers are now empowered with digital tools and require extremely personalized experience even by asking to shape the products and services. These requirements create a new ground of competition for the luxury brand and drive them toward building up an interactive platform to communicate with their customers.

TABLE I. THE FIVE DOMAINS OF DIGITAL TRANSFORMATIONS [23]

DOMAIN	STRATEGIC THEMES
Customers	Harness Customer Networks
Competition	Build Platforms, not just products
Data	Turn data into assets
Innovation	Innovate by rapid experimentation
Value	Adapt value proposition

Rogers [23] argues the value of a platform grows as more people use it and this due to the customer's expectation of bilateral value exchange. In fact, the platform can constantly improve its own features and increase participant benefits by creating a feedback loop. The data is an important asset which must be collected through online portals. Today, luxury brands can utilize social media and mobile apps for exploring customer's requirements, building communities of potential customers and using analytics and data mining to know them

better and ultimately to offer personalized and customized services. Digitalization, as discussed by Rogers [23], provides a solid platform for a company to constantly experiment, test each of new ideas, measure customer response, and iterate on what it learns. Innovation is also leveraged through crowdsourcing and receiving feedbacks via social media and platforms. These are all invaluable for designing new products and services and improving the existing one as Parker [8] argues innovation is no longer the province of in-house experts and research and development labs. Lastly, digital technologies enable luxury brands to enhance, extend or reshape the customer value proposition with digital contents and engagement, i.e., to offer better, faster and customized products and services which resonates with their personal lifestyle [24].

While some luxury brands seek solutions to digitally automate their existing operations, we observe a few luxury start-ups are shaking up the industry [25] by aggregating many luxury e-commerce sites into a personalized feed and universal shopping cart [25][26] and extracting the most value from platform business model. The platform as discussed by Parker [8] offers reach, speed, convenience, and efficiency to customize the customer's requirements on luxury brand online shops. The possibility to capture data about customers' preferences and then develop and deliver the customized products in the quickest manner can be considered other benefits which are implemented by start-ups who focus on access rather than ownership. These new ventures aim to replace ownership with access where users can register on a platform and rent luxury items such as accessories and jewelry on a weekly or monthly basis. These start-ups work on everything from lab-grown diamonds to luxury subscription services to blockchain for authenticating luxury products. Some also launch new brands and/or help incumbents by offering them luxury-specific technology tools [27]. A good example is Rent the Runway [28] founded in 2009, an online platform which rents clothes and accessories for women with different plans. Eleven James [29] founded in 2013 is another online platform which provides access to a diverse collection of luxury watches for both men and women through subscription service. Dou Bao Bao and Y-Closet are two Chinese start-ups which provide access to a high-end designer handbag and a high-end clothing respectively by following rental business model [30]. Dou Bao Bao launched its platform on WeChat, and also released an official app and is now planning to expand the service to other Asian countries including Malaysia, Thailand, Vietnam, and Korea as the model far exceeded the company's expectations [30][31]. Y-Closet follows the rental business model and charges a monthly subscription fee of RMB 499 (USD\$73) in which consumers have the option to select three cloths per month and swap them out as many times as they wish where delivery is included in the fee [30][31]. The next trend could be for the consumers to exchange each-others' items through the platforms. There are blockchain start-ups such as CEDEX [32] and BitCar [33] who focus on a single type of asset — diamonds and luxury cars, respectively. Switzerland-based Tend [34] is planning to offer a multitude of assets for

investment purpose such as vineyards, watches and other luxury items. All three start-ups are still at very early-stage and planning to raise several millions of dollars through initial coin offerings in 2018. We can, however, see that they are all examples for rising of the sharing economy and platform business which are disrupting the value proposition of traditional luxury brands and creating emerging opportunities.

Acquiera et. al [35] conceptualize the sharing economy to rest on three foundational cores including Access economy, Platform economy, and Community-based economy. The sharing economy facilitates collaborative production and consumption and drives the concept of value co-creation [36].

III. VALUE CO-CREATION IN LUXURY BRANDS

Value co-creation, which refers to the practices a company uses to collaborate with its stakeholders during the design, development, and deployment of its products and services [37], is an emerging concept and was coined by Prahalad and Ramaswamy. It replaces the hierarchical approach to management and the linear approach to innovation by affording all stakeholders the possibility to influence and bring forth meaningful and relevant solutions in a collaborative environment from product design to product consumption [38]-[40]. Value co-creation has been triggered and driven by digital technologies in recent years [41]-[43]. These technologies can facilitate and transform the vast user-generated data and input into socially and economically valuable products and services [44]. In the era of big data, every change in customer behavior, location, or even physiological data can be recorded and analyzed [45]. In fact, big data allows firms to uncover unforeseen patterns about customers, businesses, and markets [15] while offering the firms opportunities to track customer behavior and measure outcomes of competitive strategies[16][17]. Modern luxury products usually commit to a brand story that includes a visionary myth and mission [46] and technology can expand this narrative to customers. Today, luxury brands should integrate their products with digital technology to add value and address "omnichannel interactions" including "integrated delivery service," comparable "promotions and rewards," and a "consistent brand image across all channels [47]. Although it is widely shown that user co-creation is beneficial in mainstream fashion [17], we must recall that the luxury sector has always distanced itself from consumers [48] in order to preserve the exclusivity and high status. Also, it is argued that luxury is art and should spring from designers' creative genius without that much input from the end user, therefore, user-designed luxury products are perceived to be lower in quality and fail to signal high status [49]. That is why to some extent consumers expect the artists to dictate what luxury should be and how it should be experienced [49][50]. As a result the luxury sector has implemented "a top-down, we-know-best-and-we-won't-listen-to-you attitude" [51]. In non-luxury categories, it is argued that "user design" i.e., drawing on users' ideas and designs for new products, will enable firms to achieve a number of positive benefits [52][53] including reducing new product development costs, improving time to market, and deriving innovative products

which are better at meeting consumer needs and wants [17][20][53]. The Internet helps luxury brands increase consumer awareness and promote their images online by describing their brands' story and heritage[51]. However, Heine and Berghaus [54] argue that the majority of luxury brands still use mainly digital platforms to disseminate information to consumers in the classical sense of marketing rather than using social media to engage with their consumers. This strategy used to restrict the consumers' input to preserve since they walk the line between access and exclusivity, exposure and mystery, and restraint and expansion [46]. But now, the Internet is being utilized as a vehicle for luxury brands to enable consumers to share their personal experiences through narratives, co-creation and story-giving [54]. The direct interaction with consumers allows luxury brands turn storytelling into story-giving. As such these brands will not relinquish control of information creation while engaging with their consumers in the co-creation of their brand image. Tiffany & Co. [55] introduced the concept of the story giving as a powerful co-creation tool in their 2011 "What Makes Love True" (WMLT) which was a social media campaign with access to the e-commerce section of the company main website and studies shows that story-giving provide them with new opportunities to co-create stories about the brand while maintaining performance and paucity [55]. Schreier et al. [56] find that consumers evaluate a product more positively and indicate stronger purchase intentions if it is labeled as created by users instead of by the firm's internal designers. All these have created serious challenges as how to accommodate with the rise of co-creation trend which pushes luxury brands to shift their business model from a product-centric view of value creation to one that focuses on personalized and collaborative brand experiences.

IV. FRAMEWORK DEVELOPMENT AND CASE STUDY

Most successful start-ups like Uber and Airbnb have tried to improve people's life by solving something, empowering people, delivering value, fitting into their lives and giving people time back. However, many of them have challenges in building up their corporate brand at the initial stage as they had no resources, such as money and internal structure, nor did they have customers or even a consistent idea how the end-product should look like [57][58]. In fact, for a start-up, "visibility creates Opportunities", the faster it gets visible the closer the possibility of a business success is [59]. Moreover, the digital era has provided start-ups with tremendous opportunities to communicate and engage with their potential customers and stakeholders but substantial risks at the same time. Young ventures have specific branding needs due to their lack of resources [60], lack of internal structures and processes [60], and fundamental need to build a reputation [61] in order to find customers and investors. Venkatesh [62] identifies some of the challenges for start-up brand building including financial, legal and reputational risks, gaining traction and scaling-up. As such start-up branding cannot be addressed in a holistic approach since a new venture follows

a growth curve where it goes through experimenting and testing its business model. Roshanzamir [57] suggests the EIC conceptual model in Figure 1 to break down brand building of a start-up into three stages and integrate it with start-up growth stages [57].



Figure 1. The EIC model for start-up branding in the digital era [57]

The EIC framework argues that the founders of start-ups must first have a strong sense of purpose, cause or belief to solve a market need or take advantage of an existing market opportunity and cultivate innovation and co-creation mindset. Second, they need to innovate things that make them special and differentiate them from their competition. Third, they must seek to jointly create and develop value as the tangible manifestation of the first two stages [57]. The authors propose a practical extension on the EIC model to illustrate how the power of a brand story can be leveraged by IoT, blockchain and platform models, in order to influence consumer buying behaviour. The concept of smart handmade carpet is, then, introduced and used as a case study here.

A. Emotion

For centuries, Persia has been famed as the major center of oriental carpet weaving and established the standards of architecture design miniature painting, and textile production. Carpet-weaving is considered to be one of the essential manifestations of Persian culture and art, and dates back to 500 B.C., during the Achaemenid according to evidence such as the 2500-year-old Pazyryk carpet. Though carpet weaving is now mechanized in many areas, the traditional handwoven carpet still has wide appeal throughout the world as a valuable masterpiece with a much higher price compared to machine made counterparts. The price of a handmade carpet is also determined by a number of factors including origin, size, design, age, purchase value, the materials as well as a brief history behind. Some traders document all these and issue a certificate of authenticity which can even be attested by international inspection companies. However, the authors argue that IoT, the blockchain and platform business can offer a game-changing solution and disrupt handmade carpet business by bringing transparency and trust to the supply chain, dealing with counterfeiting and increasing customer engagement. These technologies bring numerous possibilities to improve operations and contribute to a marketing campaign and build strong brands by generating an immutable digital certificate.

At the early stage of weaving a carpet, we can observe that the passion, skills, and talents of the designer and weavers are a bold contributor to producing a masterpiece. Innovation and Co-creation mindsets are other important ingredients for generating a brand story that must be cultivated from early days. In fact, a luxury strategy places a high priority on localized production to support the brand

story and increase intrinsic value and the country of origin symbolizes expertise and cache [51]. That is why two pieces of carpet can be made of the same material within the same size, and even have a similar design, yet, Persian origin can reel the price by 5 to 10 times. By integrating IoT with blockchain, the smart carpet verifies the origin through smart tag embedded in the carpet from the time weaving started.

Chamrosh Technology [63] is a new start-up which is aimed to establish a platform in order to connect the luxury carpet weavers with the potential avid carpet fans and enthusiasms by leveraging digital technologies. The value proposition is to give the possibility of directly communicating with the weavers by reviewing the data and the full story of a carpet through digital tools i.e., video and pictures from the time weaving start. The platform utilizes IoT and blockchain to track the lifecycle of a carpet and validate the provenance such as origin and existing owner and other details in an immutable ledger which builds up the ingredient of a story. Griffin et. al. [64] indicates stories are often more important than hard facts because a brand or company’s stories shape its reality. Walsh [65] argues storytelling is so critical to the brand building since stories are easy to remember and share, engage our feelings, shape our beliefs and enable us to see ourselves in a different light, and more importantly influence our behavior in accordance with these new perceptions, insights, and identities. The name of this start-up is smartly selected by the founders to generate a compelling story which gains buy-in from potential customers and guide, motivate and inspire stakeholders. Chamrosh is a bird in Persian mythology said to live on the summit of Mount Alborz and is sent by an angel to snatch invaders and drop them from mountaintops to protect the Persian Land [63]. The name generate a compelling story which is easy to remember, share and engage potential customers’ feelings. Moreover, it is believed that integrating IoT, blockchain, and platform business model, indicated in Figure 2, would establish a structure to co-create value with potential customers in order to build trust and influence their buying behavior.

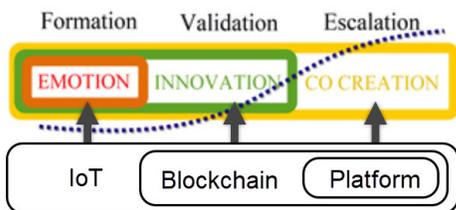


Figure 2. The practical extension of the EIC model

The framework breaks down the story of a carpet from the time procuring of knots and then weaving starts in a simple connection of cause and effect. The narrative of a carpet including the place and exact location of weaving, the name of weaver and designer together with video, audio and pictures are recorded, collected and shared with the potential customers as they are experiencing it as if it were their story. The customers feel what the weaver feels; they see what the weaver sees and experiences.

Therefore, they memorize and retain chunks of information contained in the story since they watch the images and videos, hear the sounds, and feel the emotions which are recorded in a digital ledger that is distributed, decentralized, verifiable and irreversible.



Figure 3. The rhetoric of carpet is recorded in the blockchain.

Figure 3 shows how the attractive rhetoric of a carpet can be leveraged in an immutable ledger on a vast network of computers and that put substantial monetary and emotional value at the heart of the weaving process.

B. Innovation

Innovation is considered to be a critical factor for long-term business success and organizations which have innovated successfully have typically been rewarded with growth, profits, and access to new markets throughout history, [66]. Though innovation can be the result of new technology; however, in some cases innovation is based on smart redeployment or combination of existing technologies. For example, iPhone as the most successful and amiable smartphone was not certainly the first one on the market either. Chamrosh is the first platform that fosters innovation in order to track a wealth of history behind the handmade carpet. It further builds a new experience and generates an authentic story for carpet buyers and art collectors by integrating digital technologies in the production, marketing and sales of handmade carpet in the world. The blockchain globally stores and collaboratively write a list of all transactions that have ever taken place within a given system [67] [68] and offers the possibility to keep the whole story of a carpet in a decentralized system. Therefore, when the owner of a smart carpet decides to sell his or her carpet, he or she could easily use the platform to create a digital certificate of authenticity and the next customer will be able to verify that carpet has not been stolen and that it was kept and maintained well. The uniqueness and novelty of this model are aimed to replace the legal norms and ownership rights of smart carpet without the need for a third-party authority to enforce exclusion rights. This is perfectly in line with recent arguments that the hybrid institution of property is a distributed ledger that can hold information about an intellectual property of right holders instead of a centralized government database [69] [70]. As the ownership records and other environmental data of the carpet are registered in real time system, all the pre and post owners of a single carpet, as well as the location of use, play a part in generating the story behind the carpet which can be verified. The process is described in Fig. 4 where the new ownership details will be added into the blockchain system together with some additional details including the temperature, humidity, and location of use. Here we see a paradigm shift in story-giving where the customer of a smart carpet can actively contribute in composing the story of it before selling the carpet to the next customer.

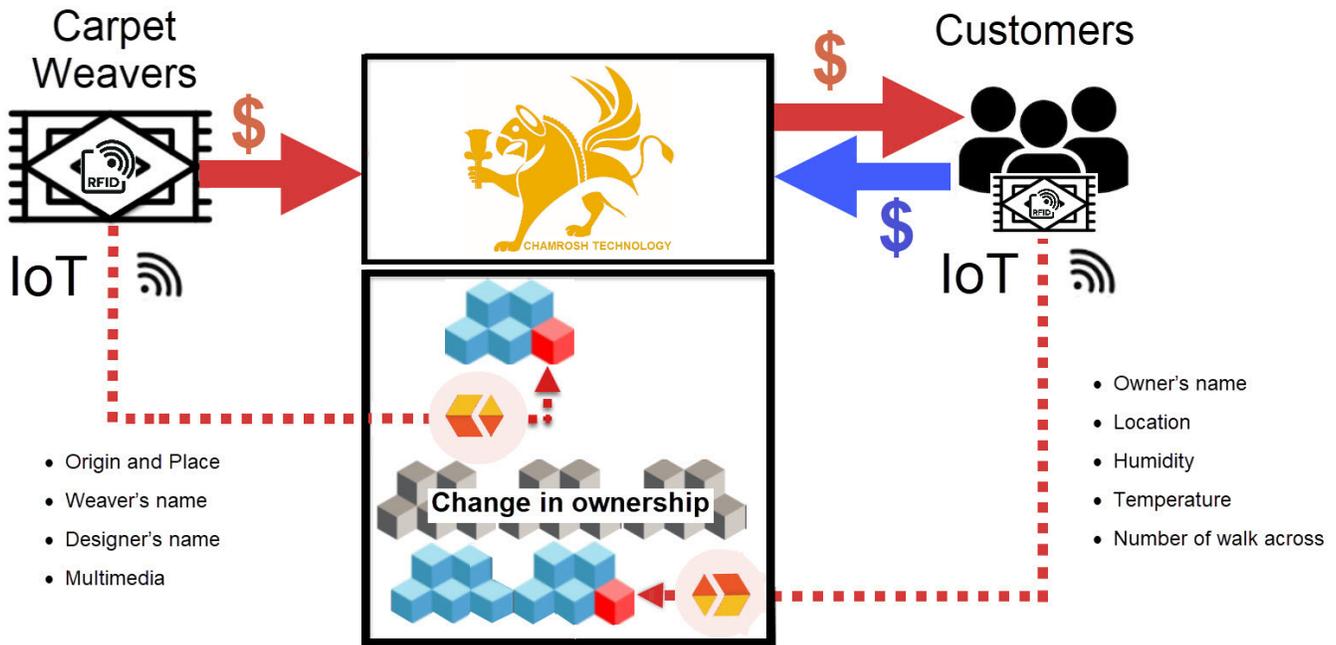


Figure 4. The smart carpet business model can address the trust issue by creating an authentic brand story [63]

C. Co-creation

Maxwell et. al [68] propose that blockchain technologies can become a new framework not only for the production (distribution and financing) of stories but also their generation. According to them the structural breaking down of stories into constituent parts and formulae is well established – from Aristotle’s analysis of tragedy in Poetics to Georges Polti identifying 36 plots to Campbell’s monomyth and Booker’s seven themes. In the blockchain, each update or transaction like owner change is a new "block" added to the chain an encrypted manner without affecting the previous one. The implementation of property rights for physical objects through IoT and blockchain applications can eliminate some functions of third-party authorities for the enforcement of property rights [70]. Of course, it is still very early to conclude that some of the blockchain applications will be able to replace legal norms and property rights, yet, we can observe how some aspects of property relations in society are being replaced with the blockchain [71].

Co-creation practically happened in the third stage when a platform empowers different players including weavers, dealers, and buyers get together in order to produce a mutually valued output through a smart carpet which integrates digital technologies. Chamrosch utilizes the sense of trust and transparency embedded with the blockchain and IoT to generate a progressive story of a carpet from the time weaving starts. The smart tag or Radio Frequency Identification (RFID) chip will collect environmental parameters including temperature, moisture, number of time people walk across a carpet and more importantly the physical location through the radio signals without building a mechanical or optical contact. All these will be recorded in the form of a new block of the story across a peer-to-peer network as the carpet moves among multiple parties and owners.

The corporate story plays an important role in creating a position for the company against competitor [72] and could influence the impressions that audiences form of the organization and therefore build the corporate brand [73]. It has been argued that sharing consumers’ positive stories about a brand can be a highly effective online marketing strategy [74]. In the smart carpet, we have a story anchored by the customer’s lifestyle, driven by digital technologies and eager to provide extra verification on a carpet origin and lifecycle. Moreover, the novel integration of IoT, blockchain and platform, suggested here, addresses the question as to what extent corporate stories represent the reality of the organization raised by Spear and Roper [73] because the data about a smart carpet stored on the blockchain reflect the real events happen during ownership. Though they are not inherently accurate and mistakes can happen during recording time just as with a centralized database, however, integrating IoT and blockchain technologies can generate an authentic brand story that builds trust. In fact, IoT is the critical tool to disrupt the existing business paradigms of trading second-hand carpet with a new way of thinking, organizing, collaborating, and creating through decentralized applications. In these circumstances, a rhetoric of smart carpet in the age of disruption can engage the customer’s feeling and influence their attitude and decision with the new perception and identify provided via digital technology. For example, those carpets which are placed at the holy sites of Islam and Christianity are traded at premium prices because the potential buyers assumed them to be blessed and cherished by the location of use. The smart carpet offers an innovative solution to trade these used carpets by ensuring the integrity of location and positively influence the purchase intentions and willingness of customers to pay a premium.

Moreover, the platform, accessible upon registration allows dealers and buyers to view and evaluate hundreds of carpets offered by different weavers and also former owners. The model also creates a pleasant experience and more choice for customers through aggregation of digital information by going beyond traditional factors such as age, design, and quality, promising them authenticity, trust, and transparency in an immutable ledger. Freemium model, which is built on an expectation of converting a portion of visitors to real buyers paying customers, increases the number of visitors to share views, comments, and feedback about each and every carpet. This will ultimately act as a strong marketing tool to promote the new start-up. Visitors can view and even verify the carpets but can neither buy nor sell within the platform. Only paid customers can utilize this advantage.

IBM Research has recently developed an Artificial Intelligent-powered counterfeit detector that verifies an item's authenticity using a smart phone's camera and then comparing the item to a database contained within a blockchain ledger [75]. The technology is accessible via a mobile app and can be used in Chamrosh to verify the authenticity of the carpet within a limited edition of carpets registered in the system.

V. DISCUSSION AND ANALYSIS

This section is dedicated to discussion and conducting performance analysis on smart carpet framework through the models offered by the most distinguished international leaders in the study of brands, branding, and marketing of the luxury goods.

First, Keller [76] argues that marketers have the opportunity to drive sales and build brands in ways never before possible by combining a diverse collection of new digital options added to the traditional media and communication options. He, therefore, suggests seven integrated marketing communications (IMC) choice criteria namely: coverage, cost, contribution, commonality, complementarity, cross-effects, and conformability [76]. These choices unlock the power of integrated marketing and can examine how effectively and efficiently they have been assembled. In order to evaluate the IMC choice criteria for smart carpet, we need to conduct a quantitative research which is beyond the objective of the existing paper. Nonetheless, we can review each criterion and examine how it resonates with the framework suggested by considering the luxury nature of smart carpet.

- Coverage for luxury brands needs to balance exclusivity with connection and honor and establish a soft barrier that makes a customer feel really special [46].
- Cost is the most important criteria to ensure an effective efficient communications campaign. It is assumed that innovation engraved in the product and platform business together with leveraging the power of social network would justify the cost.
- Contribution is certainly the most robust criteria and the essence of the smart carpet concept where the new avid carpet customer fan is encouraged to compose

and be a part of a brand story through co-creation. This criteria also resonate with a concept of "Ueber-myth" a compelling story that gives the product meaning and reverberates emotionally with customer suggested by Schaefer and Kuehlwein [46].

- Commonality must ensure that information conveyed by different communication options shares meaning or elicits similar effects across communication options which is focused on co-creating value with potential customers and influence their attitude.
- Complementarity here is focused on covering the customer decision journey and desired positioning of smart carpet which can be met by integration of IoT and blockchain.
- Cross-effects offer creative synergy among the potential customers and leverage brand knowledge at a different stage of ownership. Since the new owner can review the ownership record and reality of former customers in the blockchain.
- Conformability is a bit tricky here since the whole concept of luxury is built on the product story weaves a tale of heritage and craftsmanship [46]. The enthusiasm of potential customers and their communication record can provide a glimpse into the heart and soul of the smart carpet.

Second, Joachimsthaler and Pfeiffer [77] claim companies need to understand consumers in the context of daily life experiences in order to leverage enormous opportunities for success. They propose Episodic Reconstruction Method (ERM) which attempts to broadly capture a wide range of situations and contexts of interests. Joachimsthaler [78] further insists that brand strategy must focus on the total transformative experience of consumers as people living, working and playing and then on linking emotional benefits to tangible proof and reasons in the superiority of the product. The value of our smart carpet model can be easily determined by the ERM framework. It allows the avid carpet fans to connect and engage with the smart carpet via latest technology and become part of the story. Rather than seeking to only improve the quality of carpet that is merely different from competitors' products, the smart carpet is focused on a brand story that creates desirability. The monetary value of the smart carpet increases through direct contribution of the new owner, the way he or she fits the carpet into his or her daily life, for example, the place it is located or the number of times the owner walk across it.

Third, the circles of luxury management practices developed by Nueno and Quelch [79] would offer more focused analysis. They [79] classify four distinct circles in managing luxury brands which can ensure the success in the global marketplace as design and communications management; product line management; customer service management; and channel management. Building on their model, we can see that Chamrosh business model perfectly fulfills these circles by harnessing digital technology to foster innovation and generate a favorable market acceptance. First, the nature of Persian carpet that only increases in value over time, is evolved from handmade carpet to smart carpet by

harnessing technology and recording narratives in a digital ledger that is distributed and verifiable (communication management). Second, this evolution adds substantial monetary value every time the carpet is being bought and sold (product line management). Third, in Chamrosh platform each and every customer becomes expert in customer service, and relationship building by contributing in the rhetoric of carpet through generating a new block. In fact, the customer who buys a carpet today may purchase another item of much higher value from the platform or other customers tomorrow or even sell his or her carpet. Because more consumers are tempted to mix and match the narrative of carpets within the platform, the competition surges and cross-selling opportunities increase as they are seized (customer service management). Fourth, Chamrosh owns and is expected to manage the distribution channel by connecting weavers to customers and later customer to customer. As a developer of technology, the platform gets involved every time a carpet is bought and sold. It further charges a nominal fee to facilitate the transaction and generate a new block within the database (channel management). The other competitive advantage inherited within smart carpet platform is that it dedicates to the latest technology which is appealing to the young generation who are the potential customer of this technology in the coming years. As Nueno [80] argues, the future of many companies will depend to a great extent on teenagers' behavior and attitudes toward consumption which is shifting away from developed economies toward emerging markets, where the new wealth being generated is giving rise to an aspirational middle class. This young generation who are sometimes referred to as "Digital Millennials" or "Digital Natives" has many characteristics such as racial diversity, their status as the most educated generation to date, their low marriage and fertility rates but the most important one is that they are born with technology and considered heavy web users[81][82]. They currently form over a quarter of the American population, and about a quarter of the European Union's with an estimated purchasing power of \$2.45 trillion worldwide [82]. Therefore, the challenge for smart carpet remains as for how to target this huge market.

Lastly, with the advent of Artificial Intelligence, we see some other applications of a smart carpet have such as physical therapy where the walking pattern of the owner is detected and analyzed and then with a help of therapist these patterns can predict mobility problems and correct them, have emerged, [83]. Also, the smart carpet can identify the presence of an intruder, acting as a kind of alarm system which detects environmental threats, like fires [83].

VI. CONCLUSION AND FUTURE RESEARCH

The sharing economy and digital technologies are disrupting the luxury sector by offering a new catalyst for growth and enabling individuals to share goods and services and even contribute in the design, production, and consumption of them. Blockchain and IoT can embed tractability and visibility by recording every event and transaction within a supply chain on a distributed ledger and then a platform provides an ecosystem of suppliers and

consumers where enormous amounts of value can be created and exchanged.

This paper makes a few novel contributions to the domain of IoT, blockchain, and platform and their application in brand building, digital transformation in marketing of luxury products. It is the first study to suggest a framework for integrating IoT and blockchain and platform and apply the same in the marketing and branding field. Reviewing carpet weaving as one of the traditional businesses throughout the world and then utilizing the framework to transform this field from handmade carpet to smart carpet can be considered as the second significant contribution. Another key contribution is an emphasis on co-creating of a smart carpet brand by offering a paradigm shift in story-giving where the customer contributes to composing the story while handing over the ownership. Last but not least is that the framework addresses trust towards the smart carpet by creating an authentic brand story.

Future research is suggested to focus on conducting an empirical analysis especially on value elements and the value proposition of a smart carpet for different stakeholders in order to validate the effectiveness and credibility of the framework. The authors also believe that developing Minimum Viable Product (MVP) will help to conduct practical experience in order to humanized the new technologies, evaluate the pros and cons and bring them into daily life.

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