Research on the Innovation of High-Tech Safe Product Based on Chinese Societal Structure and Idea Exploration

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Abstract. This paper explores China's current safety situation in combination with the innovative and rational perspective to find potential improvements and or methods to solve specific aspects of the safety issues. The process is supported by extensive research and analysis of particular safety issues that outlined the problem types and consequences. This work particularly focuses on female communities and aims to design an innovative and practical product that fits the right aesthetic and functionality to support their safety. By using this innovative idea, it successfully highlights a specific aspect to target current China's safety concerns and will alleviate the problem to a larger extent if if with further research and development done with more research and development.

Keywords: Safety, Convenient, Innovative, Effectiveness, GPS-Accessory

1   Introduction

Recent studies and data have shown that there have been many criminal prosecutions against vulnerable communities. Around 1 million people are reported missing each year in China due to the country's strict public security measures [9]. Despite making up only 1 in every 1400 of China's overall population, this figure represents a substantial risk to its residents. Under most conditions, such cases are typically brought on by the victims being unable to discover the perfect chance to call for aid, especially for women who live alone and children who lack self-protection awareness. An important metric of a nation's capacity to uphold the law is the number of police officers based on an equal percentage of the population, according to a widely accepted international norm. Based on empirical data, American historian Samuel Walker noted in his book "Police in The United States" that a nation's critical system cannot function as effectively to uphold social stability if there are fewer than 25 police officers for every 10,000 citizens [7]. Any time is currently very different from the supposedly accepted worldwide standard in China. Based on its 1.8 million police officers, China currently has 120 police officers for per 100,000 citizens, which is well below the global aver-

age. The acceptable range of the population under police jurisdiction is another related indicator. According to this indicator, China had 1,400 citizens under the control of its police forces in 1991, compared to the global average of 500. At the moment, each police unit is responsible for roughly 800 individuals on average. But at the same time, police forces were largely bolstered in affluent western nations. For instance, the number of police forces in the UK rose by 15% between 2001 and 2010. The size of the force has increased by double digits at ten of the fifty largest local police departments in the US.

In this study, we investigate whether there is a market potential in China that is desirable, practicable, and viable for addressing customers' perceived safety and security issues through the fusion of new technology and fashion.

2   Literature Review

2.1   Problem and Cases

Currently, or majorly over the past decade, there has been a fluctuation in China's safety level in society. The events that continue to show a rising trend, such as female kidnapping have created negative impacts on many families. Scholars have emphasized the characteristics of such events under specific locations, for example in lower-tier cities like He Fei, and Fu Zhou that continue to see the "Kidnapping and killing or selling different people to rural places." The author is trying to explore the factors that contribute to these events, to understand the causes and offer an optimal approach. It analyzed a range of primary practical and structural issues, for instance, the ignorance of some Chinese Law Systems that allowed more kidnappers to catch the chance to making crimes. The argument is based on China's regulations that although adding up different rules to restrict crime rates, it lacks efficiency and still has some limitations for the criminals to utilize it to escape from arresting [5]. The author advised society to raise more consciousness about protecting one's safety and the government should create targeting laws to prevent more kidnapping events. Fortifying modern laws will be another approach to avoid such phenomena to happen in the future. The study by Morewitz gives an insight into an aspect of Chinese safety problems in terms of how the trend will constantly increase if no new actions have been established.

Another research from IAMCR also identified the current raping rate in China is also increasing over time. The authors analyzed the 10-year trend and real-life reports about child sexual abuse in China which is becoming one of the significant crime issues that affect the entire society, especially the child community and the female community as well. For example, 13% of the children in the Xu Hu have been raped in the past five years and are requesting governmental support to arrest the criminal (rapers). The examples and evidence-supported to their arguments of the limitation in China's law environment for children and young generations to prevent more raping events [11].

2.2   Existing Solutions

People have created methods to protect themselves in this digital age because they are aware of the multiple risks present in the rapid movement of information. Self-defense tools like rifles and sprays are two examples, however using these tools to fight crime requires a great deal of skill, especially when it's a sneak attack with a significant risk of injury. The only devices that may be used to call the police in the market are mobile phones or technological devices, thus it is possible that criminals would obstruct this alert action. The majority of ladies may encounter danger in nightclubs, KTVs, and night cabs in addition to being attacked on the road. A DIDI driver killed a 21-year-old woman in 2018 after she left the airport and was discovered on the river [2]. Following the news, we learned that there were 50 additional female victims in addition to this girl. When the females notice the danger is getting closer in these scenarios, most of them turn to their friends for support instead of phoning the police or sending out an SOS. The most crucial chance for rescue has been lost by the time their friends notice an irregularity to report to the authorities. Why they chose not to call the police is a valid question. The cause is that telephone alarms are very simple to find and silent. According to studies, the ride-hailing app is utilised by more than 20 million consumers every day and more than 400 million times annually [2]. This information is enormous and rife with peril. On the other side, reports of women being raped in KTVs and clubs have also been making a frightening comeback. Recently, a celebrity named "WU" with ten million followers learned about numerous instances of women being sexually assaulted after drinking at nightclubs. WU also revealed that at least 40 accomplices were connected to this case [6]. Soon after, a girl was forcibly taken back to a hotel after being drunk by a famous host, "QIAN" [4]. The risks that young girls confront when intoxicated and without a reliable way to contact the police have been made clear by such news. As in this instance, most crooks are skilled and would take the victim's phone to prevent this blatant alarm response.

2.3   Potential Target Segments

The target market is broken down into three sections to represent different types of vulnerable persons in society's safety issues. 70 000 children are reported missing in 2020, accounting for 7.4% of all those who have gone missing [9]. Children between the ages of 3 and 14 still have a very limited understanding of safety, so it is quite improbable that they will be able to defend themselves against harmful situations like kidnapping. Children only have a slim possibility of escaping and being saved in such circumstances. Women who work late into the night or who arrive home alone after 8 o'clock will make up the second group. Due to the lack of bystanders at night, they may be attacked or abducted without any hope of assistance. On the other hand, women who take private transportation home late from KTV or nightclubs may also run into danger. They would find it too difficult to use a device to summon the police in such circumstances. Additionally, some current products that ask for assistance emit a loud alert that could frighten criminals and endanger their lives. The elderly 65

to 95 years of age, particularly those who are widowed or have Alzheimer's disease, will make up the third category. The biggest threat to public safety in China is the estimated 500 thousand elderly who go missing each year [3]. When elderly people become lost and cannot find someone to assist them, the situation becomes challenging to handle. Even though some older people share a home with their children, it would still be very late for their kids to call the police once they find their parents missing after work. Furthermore, for elderly individuals living alone, the situation would be significantly worse. Most of them won't be reported missing right away, and it can be days or even weeks before their whereabouts are found.

In conclusion, older persons tend to depart more often, but they are often not in danger; rather, they commonly forget how to go home. In addition, several forward-thinking digital firms have already offered remedies for children's issues. However, because they are more likely to be violated, females need a product that provides practical answers to increase their level of protection in a range of situations. As a result, we think that based on our data, we should prioritize female customers when it comes to product design and marketing goals.

3   Methods

Hypothesis 1 (H1): The desirability for the customer's acceptance of the targeted solution as a new innovative idea to solve the current safety concern is high.

Hypothesis 2 (H2): The feasibility for the product is high, that the solution can be conveniently applied by existing technology.

Hypothesis 3 (H3): The viability of our solution is positive and the market would show ideal feedback after our solution is introduced to society.

4   Results

H1 Result

4.1   Data Collection

Since both insurance and our products offer protection to customers, we initially used insurance as an example to evaluate the market value of sales of our products. As a result, the data from China's insurance market do not appear to be very promising. China's average insurance density as of 2020 was $465, which is far lower than that of other emerging nations and even less than 10% of that of the United States [1]. China only obtained its 50% density, but a basic insurance density of 10% would typically be common and constant. But the information is just preliminary. Insurance density in China increased by 11.1 percent in 2020 compared to 2019, demonstrating the country's significant expansion, along with the country's GDP growth [1]. Additionally, in contrast to other countries with decades or centuries of insurance history, China's insurance market has only just started to grow. In this instance, we can observe that

individuals require time for acceptance when a product is first introduced to the market. Thus, there is a significant and positive similarity between insurance and our offer.

Additionally, we contrasted self-defense spray and guns that have our items' buying characteristics. By employing a self-defense tool, victims can buy more time and discover ways to escape while they are in danger. The psychology of customers who purchase this type of product is more in line with the psychology of customers who purchase our goods to deter robberies, sneak attacks, and other issues involving person-to-person confrontation with bad guys. We can tell from the data that consumers have a strong awareness of preventing safety, and that the annual purchase volume is tremendous (as seen from the shopping website). Overall, the outcome shows that the market views our product favorably as a prospective enticing purchase.

4.2   Interview Questionnaire and Survey

Women make up 86.67 percent of our core target audience for interviews and surveys. The user's age ranges from 13 to 38 years old, falling between laborers and students. Our survey's focus is mostly on questions on accessory fashion. In this regard, we can see that the majority of women have the habit of buying jewellery, and even 20% to 40% of women are eager to purchase an entire line of jewellery products. In addition, we included a few of our original design drawings together with our logos and a few of the already popular styles with images in the poll, and the response from the customer group has been excellent and extremely good. Moving on to the function of our product, the survey reveals that people rate their level of safety as moderately high (3.53 out of 5), but when asked if they would like a product that could improve their safety, 93.33 percent respond with high interest, indicating that they anticipate its development and have a need for it. In addition, when we put the price range between RMB399 and RMB1099, more over 40% of respondents said they might try it, and 33.3% said they would definitely buy it. As a result, the survey's overall outcome was favourable to our future prospects and closely met our predictions.

H2 Result

4.3   Technology Research

"With dimensions of 10 x 10 x 5.8mm and weighing just 2.5 grams, the Micro Hornet GPS chip is the world's smallest." This micro-sized GPS chip allows our solution to be achievable [8]. We would be able to embed chips inside the majority of accessories, with the exception of tiny stud earrings, to implement designs. Additionally, when sensors malfunction, the alarm system sends signals to a central monitoring station. The alarm control panel serves as the alarm system's main core. The panel and other system components can communicate with one other. For the panel to send outward signals, a communicator is required. Sensors can communicate wirelessly with the help of a wireless receiver or they can be plugged into a security system. A

sensor alerts the alarm control panel when it is faulty or triggered. The system will then react in accordance with the zone's programming parameters. A delay period can also be put into a zone, giving the user a brief window of time to disarm the system before an alert signal is delivered.
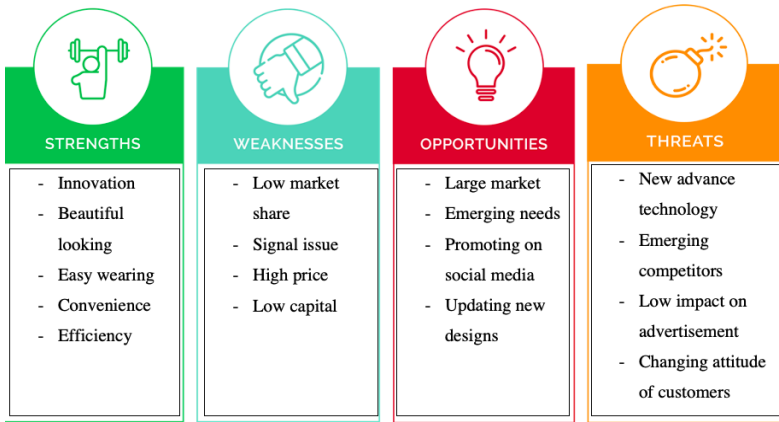
H3 Result

4.4   SWOT Analysis (see Figure 1)
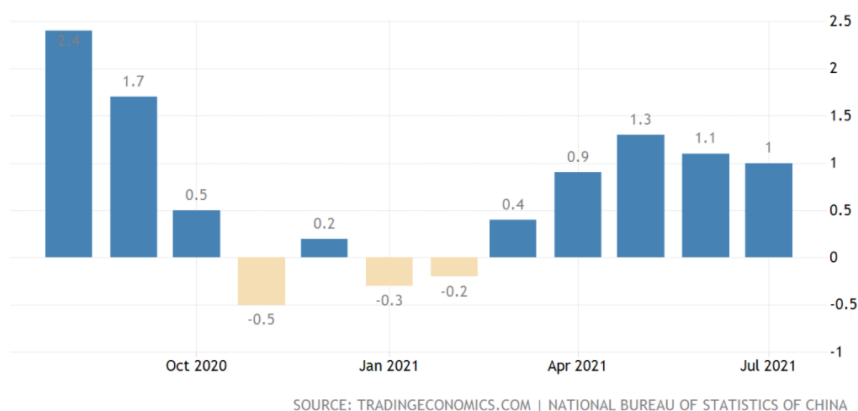

Fig. 1. SWOT Self-Planned Diagram Analysis

4.5   PEST Factors Analysis

Political factors: Our product category does not fall under the production sectors that have high VALUE-ADDED taxes due to their negative externalities, like alcohol and cigarettes. In the beginning, paying taxes won't be too onerous for the business.

    Economic factors: As shown in Figure 2, the Chinese economy grew by a seasonally adjusted 1.3 percent in the three months to June 2021. According to a statement from the National Bureau of Statistics, China's economy maintained a steady recovery with production and demand increasing, employment and prices maintaining steady, strengthening market expectations, and major macro indicators keeping within a tolerable range. There were still worries, though, regarding the pandemic's global expansion and the uneven domestic recovery. [10]

SOURCE: TRADINGECONOMICS.COM | NATIONAL BUREAU OF STATISTICS OF CHINA
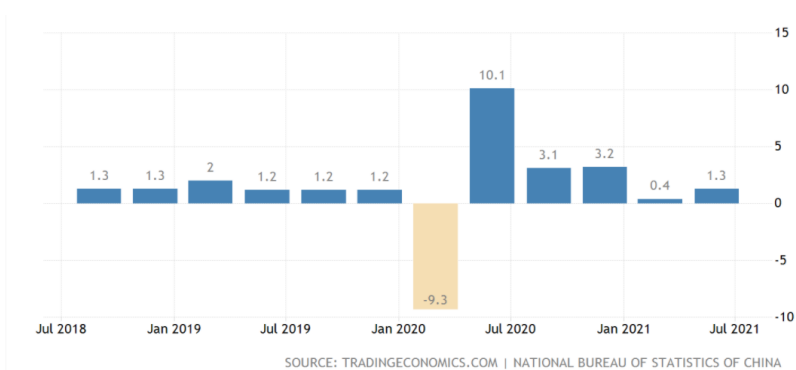
Fig. 2. GDP GROWTH RATE OF CHINA

SOURCE: TRADINGECONOMICS.COM | NATIONAL BUREAU OF STATISTICS OF CHINA

Fig. 3. Flow of Inflation Rate in China

Figure 3 shows the flow of the inflation rate in China. It informs that China's annual inflation rate edged down to 1.0% in July 2021 from 1.1% a month earlier and compared with the market consensus of 0.8%. Hence, a steady economic growth rate accompanied by an equally steady but low inflation rate would guarantee a good market prospect.

Social factors: China is a populous country with 1.5 billion people. According to the age distribution of China's population in 2019, approximately 70.6% of the population were in their working-age between 15 and 64 years old. The huge number of economically active population provides an enormous market potential.

Technological factors: The Chinese government is building many science and technology industrial parks and has given certain subsidies and support to R&D enterprises. This will be good financial support for the enterprise to expand and develop the production line.

5   Discussion

We have proved there is a demand for our solution to be implemented in China's market for the above content. In the following subsection, we will elaborate on different models attached to the marketing plan and future road map to portray a clear blueprint and analysis of our product.

5.1   Model of Product

The product is named Guardian Angel: an angel that is blessing and protecting people. It is a GPS accessory installed with a locatable chip that combines fashion with practicality. By inserting a GPS chip or SIM card into the accessory (see Figure 4 and Figure 5) and connecting it to the phone via Bluetooth, you or your family can access your location in real-time. When people encounter danger, they may not have the right opportunity to call for help. In such a case, our GPS accessory will provide a hiddable and fast way to call a police station that is the nearest to your location by sending your real-time positioning and pre-edited alarm information, which provides convenience and possibility for the golden rescue time and also offers you a new train of thought to protect yourself.
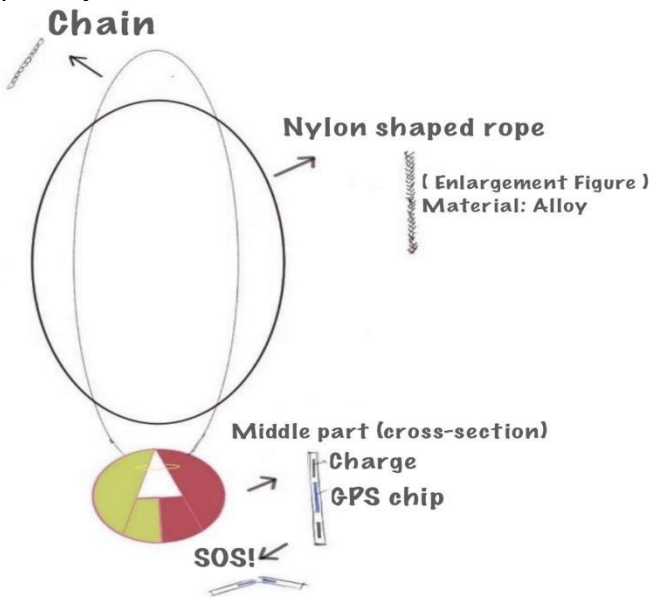

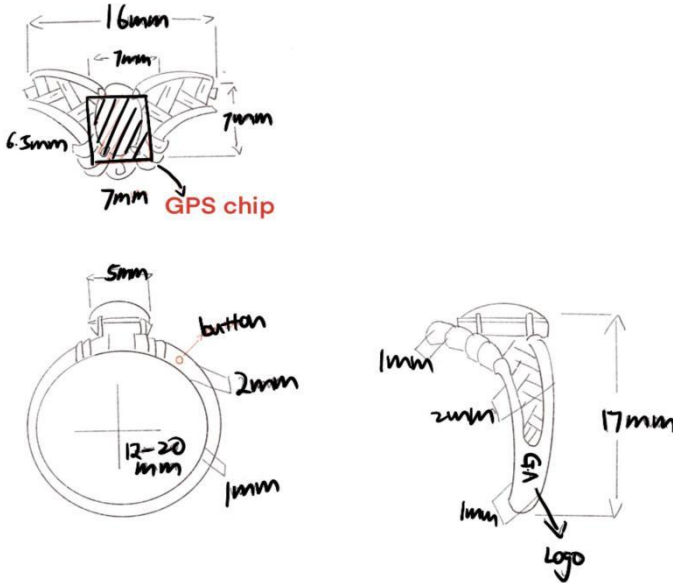**Fig. 4.** Design of a necklace with GPS function model

Fig. 5. Design of a ring with GPS function model

The GPS accessory consists of two connection methods: one is Bluetooth, and the other is a SIM card. For people living and working in cities, the effectiveness of Bluetooth connections would be guaranteed because mobile phones are always taken around them. The accessory will contain a GPS chip and connect to the phone via Bluetooth. In case of danger, you need to trigger a mechanism on the accessory (different types of accessories are designed to distinct methods respectively) and send an SOS message via the phone. Another SIM card connection method is mainly aimed at people working in rural areas. Since the network signal in such places is not very stable, instead of using a cellphone, we would use the GPS accessory itself to send an SOS message, which can be done by a SIM card contained inside. When it comes to a false alarm situation, GPS accessories connected to the phone via Bluetooth have a function to cancel the alarm on the phone within 60 seconds.

For another type of GPS accessory designed with a SIM card, to trigger the alarm, you need to pull out a side latch and then rotate it for 360 degrees, which makes it almost impossible to get a false alarm. What is more, there might be a situation where the victim does not voluntarily call the police due to his phone being taken away, but his family calls the police because of his disappearance. In this case, if the family is not authorized to view his real-time location (the user is free to choose any subjects to give access to visit his/her location owing to privacy protection), the police will need to sign an agreement with his family to get authorized to obtain his positioning. After that, the police can carry out a rescue operation by using the product's real-time location or track from the last location before the product goes off the signal.

The product also connects with a particular APP system that is designed by us in order to offer distinctive functions to support the reduction of the safety risks, and it is

clear that a detailed guide of its unique functions will show an accurate blueprint of the final solution.

5.2   Marketing Plan

Product: The design of this product would be a combination of GPS technology and jewelry. This gives customers with a wide variety of tastes the option of a personalized design. At the same time, it fills a void in current products that are very poorly designed and lack aesthetics to meet the social needs of consumers and its basic function. In addition, to provide customers with social utility, we developed a mobile application that they can use to connect with friends and allow people to participate in social activities.

Price: Throughout this pricing strategy part, we applied a model that evaluated our product's function and social level to determine the most appropriate price. By comparing the prices of GPS products that the customers can get at the same price, our product gives the consumer a better value than other options. Next, we position the product price with an ending of 6 or 9, such as $16.96, $639.66, and $1048.99 which gives people a perception that the price is lower than its actual value.

Place: In selecting a suitable place for the sales, we would opt to open our store in first-tier cities like Beijing, Shanghai, Guangzhou, and Shenzhen, as these places have the best economic mobility and the people consuming there have higher purchasing and finance levels than those in other cities. As soon as we select a city, we will choose to do some exhibitions to capture the attention of customers and enter the market; in addition, we will be able to find out which region reacts the most positively. Next, we plan on opening these stores in secondary malls. These malls are where middle and upper-class people can consume, which reduces our budget, and it is also more suitable to the position of our consumer group.

Promotion: As a first step, our marketing strategy aims to establish a positive brand image in order to reach the highest level of brand awareness. We would launch an initiative that every one piece is sold, 0.01% of the value of the product would be donated to the charity fund which may encourage people to participate with us. Some mini games would also be offered in the app to let people have better social links on this platform in exchange for points that could be converted into cash that would be donated to the victims' fund. Furthermore, we would collaborate with banks and make alliances with other brands to attract more customers.

6   Conclusion

This report mainly focuses on the improvements that could ameliorate the existing flaws of China's public security administration system and safety problems in society. There is an expectation of us that such a product would be capable of reducing potentially dangerous conditions for various groups in society, especially for the female community that is struggling with safety issues. Furthermore, to the aim of helping

more people and providing them with better services, we will devote ourselves to the research of additional functionality.

Nevertheless, our exploration in China's market limits us to establish a comprehensive examination of all dangerous situations, hence the temporary failure of connecting to the international market. Consequently, more effort is required to be made when considering fitting into an international configuration.

Last but not the least, the finding can provide a new enlightenment to the future ideas that new innovative products could successfully lower the crime rate and all the assumptions of improvement turn out to be reality.

Acknowledgment

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