

Future Trends Report
Based on Analysis of the Team’s Chosen Community / Organisation in Mid-Term and Final Evaluation

Community / Organisation Studied: Changi Airport Group (CAG)

Note: all survey results were taken on 1 August 2020

STEP 1. Identify Challenges

Why We Chose Changi Airport Group

We have decided to choose Changi Airport Group as our target company. Changi Airport Group operates Changi Airport, and since the airport’s opening in 1981, it has been consistently rated as one of the best airports in the world. CAG plays a crucial role in the aviation industry in Singapore. By taking advantage of social media phenomena such as FOMO and Big Data, we believe that CAG can make use of social media to attract more visitors.

Challenge #1: Dining Options

Changi Airport relies on its reputation to attract visitors, and its business is a telltale sign of how popular it is. Based on information collected from 56 respondents, 73.2% of respondents felt that restaurants are the most important facility in airports. However, only 20.5% of respondents felt satisfied with the restaurants in Changi Airport, which is a problem that will affect Changi Airport’s popularity, and thus its business. It shows that Changi Airport is not up to par with visitors’ expectations. According to research, most people enjoy eating at restaurants as they can meet new people and eat food that they cannot cook at home. Besides fulfilling all of that, restaurants also cater to the human need for connection and shaped social relations. They are the shared kitchens and dining rooms of modern cities. Restaurants also play a huge role in the economy and business of cities, or this case, Changi Airport. Thus, having restaurants that are not good enough for visitors is a huge problem. Hence, through solving this issue of dining options in Changi Airport, it can directly increase the revenue of Changi Airport and also attract more visitors to it.

Challenge #2: Shopping Experience

Based on the survey we conducted, we realized that the other facility that was most sought for in an airport is shops. 69.6% of respondents felt the need for shops in an airport. However, only 20.5% of respondents felt satisfied with the shops in Changi Airport. This could be because many shops are duty-free shops that sell expensive items, or that they sell ordinary items. According to research, a unique experience in a store allows people “to interact with the products in an unexpected way”. If the customer leaves the shop after experiencing something enjoyable and unique, the store leaves a deeper impression on the customer, which prompts them to visit these stores more often. For example, London’s Heathrow Airport, the world’s best airport for shopping, gives visitors a personalized experience when they visit any shop. It also has a larger variety of shops, such as shops for fashion, toys, travel essentials, and many more. According to research, a totally satisfied customer contributes 2.6 times as much revenue as a somewhat satisfied customer and 14 times as much revenue as a dissatisfied customer. Therefore, it can be seen how important a satisfied

customer is to generating revenue. However, Changi Airport has a relatively normal shopping experience, and thus visitors will not be fully satisfied. This will be further aggravated in the future when standards are higher, and thus will be a problem in 2030.

Challenge #3: Instagram Experience

Based on our survey, only 64.3% of respondents liked Changi Airport's Instagram page. Although this percentage is above half, it is a small amount as compared to other airports' Instagram pages. 55% of the respondents agree that this is because Changi Airport's Instagram contains too many posts that advertise the products offered there. Furthermore, statistics show that there has been a decrease in the followers' rate on Changi Airport's Instagram page. This could be due to an overwhelming amount of advertisements, or the COVID-19 pandemic, which makes visitors feel that it is useless for them to visit the airport's Instagram page when they cannot travel. This is a problem as "the main purpose of a company's Instagram page is to extend its reach, and to help to promote their services", which is something Changi Airport is not doing successfully. Based on some research, Instagram has proven to be "a powerful marketing tool for businesses looking to expand their presence and the potential impacts of their products". It also "puts a face to a company" and "is a visual platform to help companies form a more personal connection with customers". Through the analysis of data on Instagram, companies can find out the needs and expectations of visitors. We can conclude that Changi Airport is not doing enough with their Instagram page, which is a problem. If they use and control the Instagram page correctly, it could attract more visitors to Changi Airport. Hence, we deem this as a problem.

Challenge #4: Internet Connection

Based on our survey, 76.3% of respondents expect good internet connections at an airport. However, only 30.8% of respondents felt satisfied with the WIFI at Changi Airport. This is because of the lengthy process to acquire access to the internet in Changi Airport. Visitors need to go to a website and confirm their identity before they can use the free WiFi for 3 hours. Besides that, there are only 100 desktop stations across the 4 terminals that visitors can use. This will be inconvenient to visitors due to a lack of desktops. Research shows that the quality of the internet connection affects the choices visitors make when going to airports and hotels. According to research, Honolulu's Daniel K. Inouye International Airport has the fastest download speed among airports of 145.12 Mbps. With a download speed of over 100 Mbps, streaming HD movies is not a problem. However, the average download speed at Changi Airport is only 46.12 Mbps. Thus, this is a problem, as travellers might need to download important information for their trips, and a good internet connection is important.

Challenge #5: Poor Customer Service

Based on our survey, only 12.8% of respondents felt that Changi Airport has good customer service. Based on research, customer service increases customer loyalty, which in turn determines how often a customer visits a place. Good customer service also "adds value to the product". If "good customer service is provided, the value of the products immediately increases". Positive reviews and brand image will also be produced when the customer receives good service. Poor customer service results in a negative brand image, which might be shown in the form of posts on social media, or reviews on the website. Hence, this is also a problem faced by Changi Airport.

STEP 2. Craft the Underlying Problem

Incorporating Challenges #1, #2 and #5

Underlying Problem:

Given that visitor satisfaction of Changi Airport is increasing slowly and unsteadily, it can be seen that visitors are not completely satisfied with Changi Airport's services. All of these problems will make visitors feel that Changi Airport is not living up to its expectations. How might we make visitors feel more satisfied with the experience Changi Airport gives them from 2030 onwards?

STEP 3. Produce Solution Ideas

Solution #1

One solution is to introduce AR vision in Changi Airport. When one wears AR-enhanced glasses, a popup will appear on the wearer's glasses that display information about the area that they are looking at. The AR glasses will also recommend shopping and dining options based on patterns found from the visitors' previous visits. Based on research, "AR allows the wearer to see both the physical and the virtual world at the same time. Besides that, it also makes the experience more immersive as it is harder to distinguish what's real and what's augmented". This provides visitors with a detailed knowledge of the airport and facilities at any given point of time. With advancements in technology and decreases in AR hardware manufacturing costs, AR will be more accessible for people by 2030.

We aim to start the design and development of AR systems and AR glasses at Changi Airport by 2023 after getting permission from the government and CAG's board of executives. We will carry out public testing at Changi Airport from 2024-2028. When feedback is collected and the system is improved, we will release it for public use by 2030.

Solution #2

The second solution will be to totally renew Changi Airport and give it a new look. By doing so, the whole airport will be renovated to suit the needs of visitors and give them the best experience they have ever had in an airport. For example, advanced interfaces around the airport will give visitors a sharper digital experience, thus increasing visitor satisfaction. Based on research, luxurious facilities will increase visitor satisfaction due to better experience there. This also helps to attract visitors to return to Changi Airport again. The digital interfaces will allow visitors to easily comprehend the departure and arrival process. With new airport designs, better lighting, newer facilities, and modern interfaces, visitors will feel more comfortable in Changi Airport and thus will feel more satisfied with the airport.

We hope to start the design of Changi Airport by 2022 together with CAG and the Singapore government. The renovated airport will be completed by 2040, due to various constraints, such as the need to renovate only one terminal at a time to prevent Changi Airport from losing business. Visitors can start experiencing the new airport by 2040.

Solution #3

The third solution will be the full automation of Changi Airport. Everything in the airport will be automated with AI and mechanical processes. A fully automated airport gives visitors a seamless and personalized experience at Changi Airport, with the help of artificial intelligence (AI). Based on research, "AI uses Big Data and algorithms to predict human behaviour" and thus can give visitors personalized experience. This means that the machine can adjust responses based on data to ensure that each individual receives the best service for their next visit. Besides that, research has proven that AI can optimize waiting times and scheduling of different purposes such as baggage collection or the assignment of gates to different flights to optimize fuel usage. "AI takes data and uses it to identify the best representative available to address the visitor's needs", which saves time and manpower and also helps the airport to address issues more efficiently.

We hope to work with partner companies to implement AI and automation services by 2025, with public testing completed by 2027. After reviews and improvements of the system, the fully automated airport will be completed by 2030.

Solution #4:

The fourth solution would be to collect data from the public through multiple channels such as social media accounts and surveys. This would allow Changi Airport to offer travellers more personalized advertisements and travel experiences. Through information gathering methods like web scraping, personalized data like hobbies and age can be gathered in a central database. Changi Airport can then offer people advertisements that will appeal to their interests. This will better attract people to visit Changi Airport.

We hope to start data collection by 2022. Data collection will continue even after targeted advertisements are released for better personalization. The targeted advertisements will be rolled out by 2029. To protect visitors' interests, there will be an option to opt-out and not take part in the collection exercise.

Solution #5

The fifth solution is to develop an app to allow visitors to order from restaurants and retailers in the airport and allow them to set the timing for the purchased items to be delivered at any time after they arrive at the airport. This can reduce the time visitors spend on walking around the airport aimlessly by presenting all the shopping and dining options in the airport to them. Based on research, the time spent waiting for services at the airport, does not only determine visitor satisfaction but also moderates the satisfaction-loyalty relationship between the customer and the company.

We aim to work with mobile app development companies to start the designing and development of the app by 2022. After public testing and receiving feedback, we will improve the app and upload the app to the Play Store and App Store by 2029 for download by the public.

STEP 4a. Select Criteria

Criteria #1

Time Needed To Implement

Criteria #2

Cost of Implementation

Criteria #3

Potential Impact of Implementation

Criteria #4

Maintenance Requirements After Implementation

Criteria #5

Originality of Implementation

STEP 4b. Apply Criteria

Solution #	Solution Idea	Criteria					Total/ 25
		1	2	3	4	5	
#1	AR Vision	4	4	5	3	5	21
#2	Total Renewal	1	1	3	5	1	11
#3	Full Automation	2	2	4	4	3	15
#4	Data Collection	3	5	1	2	4	15
#5	Mobile App	5	3	2	1	2	13

Note: the higher the score, the better the solution.

STEP 5. Develop an Action Plan and Evaluate its Feasibility

Action Plan Derived from Solution #1: AR Vision

We, the Freedom is Ours, together with CAG and the Singapore government, will design and distribute AR glasses in Changi Airport for visitors' use, and name them the Changi AR. The Changi AR allows visitors to have an immersive experience in Changi Airport to understand the history and significance of locations around the airport. Changi AR glasses can be rented for free on a first-come-first-serve basis at the airport.

To ensure the sustainability of one pair of Changi AR glasses, the glasses' frame will be made using carbon. Carbon allows the AR glasses to be durable, but yet light in mass. The carbon frame will also be lined with waterproof material to make cleaning the glasses easier.

Some possible resistors to the glasses are people who are resistant to a new airport experience, or the elderly, who are unable to comprehend the function of the glasses. To solve this problem, we can collect feedback on why they don't like the experience to improve the Changi AR. Through designing an elderly-friendly, interactive guide, the elderly can learn how to use the glasses. If they need help, airport staff would be able to assist them.

Possible supporters of this idea are CAG and the Singapore Government. The government will want to rebuild the economy as fast as possible after COVID-19 by attracting more visitors. CAG will also want to give visitors a brand new experience to promote the airport.

Our intended implementation timeline is to complete the AR system by 2030 and ensure that it can be run smoothly by then. In 2023, Changi AR glasses will be designed by CAG and its partner organizations. In 2025, the production of the Changi AR glasses and programming of AR capabilities start after approval from the government. In 2027, the AR system will be completed and the glasses will be produced. In 2028, public testing starts in Terminal 1 of Changi Airport, with feedback collected. In 2029, the improved Changi AR will be implemented and by 2030, Changi AR will finish its final testing and be ready for public use in Changi Airport. By 2032, we expect that the Changi AR will be in full use in Changi Airport, and even in Crowne Plaza Changi Airport, and Jewel Changi Airport.

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