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Viability of Rental Chillers for the GCC Region by Using UAE as a Baseline

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VIABILITY OF RENTAL CHILLERS FOR THE GCC REGION BY USING UAE AS A BASELINE

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Abstract

The HVAC industry in the UAE is a lucrative business, with five companies operating in the UAE, two of which are major players in the market. COMPANY-X, is one of two and it is a multi-million-dollar company headquartered in the USA. The company has franchises in Dubai and Abu Dhabi, along with several dealerships across the country. Despite considering entering the rental market for the past six years, however, it remained just an idea until the outbreak of the COVID-19 pandemic in 2022. The pandemic resulted in a surge in demand for rental services, specifically in the testing and vaccination tents. However, the demand had a steep decline in testing centers after a while. The experience opened new opportunities for COMPANY-X's leadership to re-evaluate its position and decided to implement a rental business model by the end of 2025 for different purposes. The team of the company has proposed a solution and business model, which has been presented to the GCC leadership, with plans to launch a pilot program by December 2023. If the results prove promising, COMPANY-X plans to implement a region-wide business model in the UAE, KSA, Qatar, and Kuwait. This capstone project aims to discuss and evaluate the implementation of the new policy and the potential benefits it brings to the company. Based on the data and analysis of the paper, it would take approximately 2.06 years to recoup the investment. By establishing a fixed minimum rental prices according to table 7 for the next 15 years, it becomes evident that the initial investment is projected to yield approximately 600%-950% in the long term.

Keywords: Rental, Chillers, HVAC, payback period, Viability analysis, Pilot program

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Section 1

Introduction:

Despite being a niche market, the rental of chillers in the UAE remains largely unexplored by companies in the region. This can be attributed to the challenges of this industry. One major challenge is the high initial investment required to procure and store the specific chillers that meet the range of cooling capacities that are desired by the customers.

COMPANY X is a really well-known player in the HVAC industry, operating in commercial, residential, and aftermarket sectors. While their European sister companies are mainly focused on chiller rentals due to their high profitability, COMPANY X aims to tap into this market to increase revenue and project higher forecasts to their global leaders.

A detailed analysis for COMPANY X will be conducted in collaboration with other rental companies to evaluate the potential and feasibility of the business model. Collaboration with these companies can help detect if the demand for the type of service the COMPANY X plans to offer, and additionally, it can help investigate if this demand can generate enough revenue to sustain the business model. Conducting this research is critical to ensure that COMPANY X can establish roots in the rental industry, achieve financial stability and continue to be a leading establishment in the middle east for the HVAC industry.

Given the high prices of equipment, maintenance costs, and the need to remain competitive with other rental companies, the main motive to implement such a project is to added additional revenue to the company. Additionally, the international status of COMPANY X presents legal and regulatory constraints that must be taken into account, such as limitations on renting only to COMPANY X, and not any competitor, else it would be a conflict of interest. Nonetheless, the leadership team is determined to enter the rental business, seeing it as an untapped market in the UAE, and hopes to follow the successful business model of European rental companies.

The implementation of the project is set to begin in early Q1 of 2023, with the business model slated to roll out by the start of Q3. During this period, the model will be fine-tuned, and a six-month review will be conducted in early Q1 of 2024. The leadership team will review the data and assess whether the business is truly ready to enter the rental market. This review will be a

critical juncture in the project, as it will determine whether COMPANY X can continue to pursue this venture, or whether it needs to reconsider its approach.

In conclusion, determining the viability of the rental market requires extensive research, collaboration with other rental companies, and careful consideration of the challenges posed by t he market. The success of the project is dependent on achieving an attractive payback period while remaining competitive in the market. Nonetheless, the leadership team is determined to enter the rental industry and sees it as a valuable opportunity to establish roots in a new market. The implementation of the project is slated to begin soon, and the team will conduct a review after six months to determine the project's future.

Expected Project Outcome:

The primary objective of the project is to introduce a rental business model in the UAE market to supplement COMPANY X's existing operations. COMPANY X is recognized as one of the HVAC providers in the market, but this project is not solely driven by this fact. The project came to fruition due to the increased demand for rental chillers during the COVID-19 pandemic. Multiple government and private agencies requested for rental chillers from COMPANY X, but the company was unable to fulfill the demand and had to rely solely on subcontractors. The company was able to reach their yearly target within the UAE alone, overshooting by approximated 40%. However, there was still a substantial loss of revenue due to capacity constraint. Hence, the motivation to enter the rental business market re-emerged.

One of COMPANY X's clients, a facilities management company which is responsible for transporting and storing of chillers, have expressed greatly that if COMPANY X was involved in the rental business, they wouldn't have to store or be involved with keeping chillers as part of their logistics. More precisely, by entering the rental business, COMPANY X aims to expand its revenue stream, better serve its clients, and enhance its overall business model.

To achieve this goal, the company plans to conduct a thorough analysis of the market and collaborate with other rental companies to determine the feasibility of the venture. They will evaluate factors such as equipment pricing, maintenance costs, and storage requirements to ensure an attractive payback period. The implementation of the project will occur in phases, starti ng with a pilot program in December 2023, followed by a region-wide business model rollout in the UAE, KSA, Qatar, and Kuwait, depending on the success of the pilot program.

Overall, the project's primary objective is to supplement COMPANY X's existing operations and enhance its overall business model by entering the rental business market. By achieving this goal, the company will expand its revenue stream, better serve its clients, and become a more competitive player in the industry.

Aim and Goals:

The aim for this capstone project is to assess the viability of a rental business model for COMPANY X and to provide a comprehensive plan for its implementation. It is crucial to ensure that the payback period is reasonable before moving forward with this project. To achieve this, a t horough analysis of the rental market will be conducted. Also, to assess the potential and feasibili ty of the venture the project will collaborate with other rental companies.

In parallel, the news about COMPANY X being in the rental business should be spread out to the clients. As a pilot program, the market response will be analyzed, along with the financial data, to decide if proceeding with the project is worthwhile. That is because the goal is not just to enter into the rental business, but also to ensure that it is justifiable and a lucrative endeavor for COMPANY X. That can happen by introducing a bulk of chillers into the GCC market with the COMPANY X brand without the need for customers to worry about maintaining the equipment. This would lead to additional initiatives and the expansion of COMPANY X customer base for COMPANY X's maintenance contracts of airside equipment.

The long-term goal is to establish COMPANY X as a major player in the rental industry in the GCC region. The success of this pilot program will pave the way for implementing a region-wide business model in the UAE, KSA, Qatar, and Kuwait. This will not only increase the revenue for COMPANY X but also help to fill the gap in the rental market that has been overlooked in the region.

The current goal is to determine if this is a viable undertaking, however, the final goal will be the introduction of bulk of chillers into the GCC market with the COMPANY X brand without the need of customers to take the headache of maintaining the equipment. This can lead to additional initiatives along with expansion of customer I-base for COMPANY X maintenance contract of airside equipment.

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Section 2

Literature review:

According to a FOCUS article written in 2018, it points out the different ways that rental chillers can be utilized. Since the global rental business is expected to grow at an astounding 7.62%, Many have taken this growth trend and started to offer rental equipment to their clients. TRANE has a wide variety of chillers with different cooling capacities in their fleet and rents this equipment to both end-users and contractors. The time period typically last around one to two months according to the director of rental services in TRANE. Rental is based on two methods, Planned and emergency rentals. Emergency rentals constitute when permanent equipment fails or is in need of shutdown and temporary cooling is urgently required. Planned rentals is when there are planned facility shutdowns or maintenance and even special events. Planned rental is also inclusive of when the permanent equipment is not able to achieve the required cooling load and therefore, a temporary chiller is required during the peak seasons to accommodate the required cooling load. The application can vary depending on the different industries and include hospitals, schools, manufacturing processes food producers, etc. Temporary chillers are completely versatile and compactible in different industries. For one such customer in the pharmaceutical industry, they utilized the rental chillers to build a load profile, which helped them purchase an efficient permanent chiller. When looking at this as a solution, renting of chillers comes with a huge number of benefits, one of the main reason is that customer is able to shift this cost to the maintenance budget and not utilize a huge capital for the replacement of the equipment. In parallel, rental can often be sourced fast and not have massive lead times unlike permanent equipment. With the recent global logistics crisis, one can safely assume that lead times are going to increase, according to logistics analysis, by Q2 of 2023, lead time for purchasing of COMPANY X chillers with US origin, is drastically going to increase to one year. One such rental company in Dallas, provides their chiller services to contractor, and often contractors would sent their customers directly to the rental company, as it would be cheaper as contractors would just have to put their margin s on the rental company's proposal and drive up the price. The additional on rental equipment has led to unexpected value-add on and off the books.[1]

This is not the first time a FOCUS article was written about the use of rental chillers. Back in 2006, in an article titled "Rental chiller a commercial option for vintage", to achieve the optimal

temperature of 15 ºC, winemakers utilized this rental solution provided by rental companies to ensure that they are able to maintain these optimal temperatures during peak season where hot temperatures can lead to out of optimal temperature range.[2]

With the implementation of rental services, one can safely assume that COMPANY X will be ready for any plans/growth in the middle east market. As per construction weekonline.com in 2016, due to the increase of development of smart cities and green buildings, the HVAC industry is set for significant growth especially because the main driver behind these projects are backed by real estate groups and governmental entities. With the increase of HVAC regulation bodies, HVAC industry needs to ensure that they are providing the latest technology and energy efficient standards. With HVAC industries looking to expand their role in middle east, there is an expectation to see a massive growth in the market in the coming years. especially when one takes into consideration that customers will have to adhere to the new HVAC standards and the current logistics crisis, implementation of the rental business model can be rolled out and reach success if planned and carried out competently.[3]

The main reason why companies can implement a rental solution for customers and help educate the customers/market about this solution is due to the fact that they are able to control every aspect of this solution from the installation to the maintenance of the equipment. Other market players, utilize this option of renting chillers, only as an add-on option, for selected projects. If companies can educate the customer base to proceed with chiller rental, where they pay the company a price and the company takes care of every other aspect of the equipment including, but not limited to, maintenance, Selection of the appropriate equipment, expertise, breakdowns, transportation and storage, etc. then taking this aspect over from the customer by asking them to outsource it to the company is not a bad idea for the customer. They pay the company a monthly advance for the rental equipment and take not headache, while the company maintains the equipment and any issue that rises can be controlled, especially since service companies already have the manpower to assist with emergency situations and the above factors that customer normally needs to take into consideration can be ignored as companies normally have their workforce/manpower update on their technologies, which help them have a competitive edge on the market.[4]

Why is there a need to care about renting air conditioning equipment? According to an article published by Air conditioning, heating and refrigeration News in 1998, there is a need to care because it allows to not only bill additional revenue, but also retain existing clients and possibly add new clients to the existing customer base. Wherever there is production facility trying to increase output or decrease costs, the rental market always opens opportunities in any field. There are three instances where clients will request for rental services. Emergencies, planned or creative. Emergencies are right after equipment failure, Planned are when they are retrofitting or replacing the equipment where shut-down is not acceptable and Creative is when they are expanding by increasing production, increasing quality or decrease cost of processing. By utilizing vendors who are already in the market, companies can mitigate the initial capital cost of opening the business and provide equipment as per the requirement. There are many clients who are in need of this service and can range from the medical industry to research centers to refineries and chemical plants. Rental can also open opportunities to for the sellers to propose to clients to replace the their equipment with equipment equipped with the latest technology instead of replacing old technology which can be classified obsolete in a few years. [5]

From another article published by Air conditioning, heating and refrigeration News in 1998, they have pointed out that loss in HVAC equipment can result in loss of revenue especially if a company's equipment is used not for HVAC reasons but for standard day to day operation like a injection mold factory, etc. Since loss of cooling will result in loss of revenue everyday, finding a rental solution can help provide a chiller to be installed and running within a matter of 24 hours. They point out the example of where a school needed a chiller for temporary cooling while the existing chiller was getting repaired. They sent their team to set-up the temporary chiller and with the usage of temporary and few connections they were able to have the system up and running in one day. Versality is very important as one day they chiller might be installed in a school and the other day it could be installed at a power plant factory. With the help of micro-processor controls for easy operations and diagnostics and also with built-in transformers, adapting to the site power is very easy. However, when looking to rent chillers, it is also very important to consider the type and location of the site where companies are installing the chillers. Air-cooled is by far the most commonly rented chiller with ease of usage, however, the power to tonnage ratio is higher compared to water-cooled chillers and in parallel, they also cannot be installed indoors as they require high airflow to avoid recirculation. [6]

In an article titled opposing views, where the subject of renting Vs buying was discussed, James Irish who supported the view of renting items, stated that when companies take the option of renting equipment into consideration, companies have to consider some factors such as the length of time you would use it or even the number of times you would use it. If an equipment is not used regularly and purchasing capital is high, then rental is the better option, as you are paying for the short-term use of the equipment as a fraction of the price of the initial investment. In parallel, hidden costs are also eliminated such as maintenance or repair which removes downtime of the equipment as rental organizations will have to take that into their own dime. Also renting of equipment helps offer massive equipment choices and rental centers would keep updating their inventory which will keep the technology updated unlike buying of equipment where technology can get obsolete within a few years. Renting of equipment can not only increase cash-flow, but also reduce equipment cost and frees capital without increasing the debt-ratio.[7]

Another article from the post shared their thoughts and opinion on renting Vs buying Vs dividend investing, the topic was discussed in length but by taking homes instead of equipment and the article came to the same conclusion as James Irish from the article of The Post, but went in depth on how renting and buying a home is effective based on what the current social and economic climate was and how the US government can indirectly assist by helping individuals getting low interest rates.[8][9]

The literature reviewed highlights the significance of rental services in the expanding HVAC market of the Middle East, emphasizing its strategic role in line with smart city initiatives. Nevertheless, the existing literature lacks a discussion on a business model, accompanied by a case study, focusing on the rental of air conditioning equipment for revenue generation, client retention, and meeting diverse industry requirements. This project seeks to address this gap by presenting a case that delves into the specific challenges and strategies associated with the implementation of rental chillers in the HVAC industry, with a particular focus on the Middle East.

Section 3

Methodology:

In order to gauge the interest of existing customers in this service, a survey was conducted (it can be found in the appendix. The survey consisted of different questions regarding the industry that the customers' companies.

The following question were posed to the customer:

- What industry is your company involved in?
- If given the option of renting of chillers, would you as a business/building owner be interested in this service?
- What payment terms would you prefer as a business partner if rental of chillers is open as an option for your business/organization?
- If you wanted to rent chillers, please rank the order of preference of which chiller you would be most likely to rent. [1 being most likely and 5 being least likely], with the names of the big five HVAC market players listed to the customer.

Anonymity was assured to the participant customer as COMPANY X was looking to obtain honest responses and determine the necessity of implementing this business model within the current model of COMPANY X, to further enhance the customer experience for the customer base.

Utilizing data gathered from its projects spanning the last seven years, Company X discerned the cooling capacity needs expressed by its clients. Subsequently, the company utilized this information to determine the particular models of chillers to integrate into its rental fleet. Once the range of cooling capacities was determined, to ensure not ordering unnecessary bulk of chillers during the pilot stage, the quantity required was downsized. By conducting market research, including interviews with ex-personnel from the company competitors, the size of the e xisting competitor's chiller base was identified. The potential business growth was calculated. The payback period along with the amount of equipment required for the program, logistics requi rements, and personnel required to maintain the equipment were calculated, using the pricing rates of the sub-contractors.

Along with the payback period, a Gantt chart was used to layout the timeline to roll-out this pilot by June 2023. Then using the same template, COMPANY X will roll-out the program in the King dom of Saudi Arabia, Qatar and Kuwait.

All the above processes and timeline were provided and presented to the General managers of each entity, to the director of Aftermarket, CFO, FP&A of the GCC region and finally the President of HVAC in the Middle East, Turkey and Africa.

Analysis of survey:

The survey was taken to confirm customer interest in this model. As the pilot program would be implemented in the UAE first, the survey was limited to only UAE existing customers.

This helped the company to have a grasp on the understanding of customer needs and since the customer base for COMPANY X ranged from high-end VIP governmental customer to factories, residential and single individuals, the company was able to achieve a high coverage of customers from different industries.

All customer names/any individual's identity has been removed to ensure that the secrecy in their identity. A total of 55 customers were surveyed, as shown in table 1, out of which 89% of the surveyed (49 out of 55 customers) displayed keen interest in the idea of having rental chillers from COMPANY X directly. 34% of the surveyed was shocked that COMPANY X didn't have the rental business in place and 25% was happy that they could rent chillers with the same Brand corresponding with the brands in their building, as external companies would increase the fees of rental when they find out that there were looking for specific brands. The reminder 11% of the surveyed, were simply not interested in the idea and their response was more hostile than friendly. A much more in-depth analysis into the results of the survey showed that all the 11% of customers were part of the manufacturing industry. This then made sense, as all the manufacturing industries have the tendency to replace their chillers every 5-6 years due to contamination of the chilled water from the plant into the chiller. If the process cooling plant was properly fabricated using a heat exchanger to be in the middle of the cooling plant and process plant, then the life-expectancy of the chiller would fall back into standard range, depending on the cooling loads.

S#	Industry	QTY
1	**Commercial Industry**	3
2	**Food Retail Industry**	3
3	**Government Industry**	5
4	**Residential Industry**	2
5	**Digital/IT Industry**	8
6	**Healthcare Industry**	6
7	**Marine Industry**	5
8	**Retail Industry**	1
9	**Education Industry**	8
10	**Hospitality Industry**	7
11	**Manufacturing Industry**	7

Table 1: Customers from different industries

The question about the payment terms was provided, to provide a sense of control to the customers, that their decision answers were taken into consideration and to see if they would think rationally and put the needs of the company before their own about the questions and model being introduced. The payment terms either payment in advance or payment in arrears and unsurprisingly, all customers answered payment in arrears.

The final question was about their brand preference. To rank the brand, they preferred the most "1", all the way to the brand they less preferred. As the surveyor was calling from a specific brand, many customer tried to play that COMPANY X was their number#1 brand, however, when the surveyor mentioned that this call was anonymous and anything said wouldn't hurt them in anyway or form, 25 out of 55 were quick to change their answer, 10 out of 55 informed me that they really didn't care about who was provided the rental service or even the chiller brand. Since the lowest rank 1 was the best preference and rank 5 being the least preferred, the summation of the ranks with the least numerical value was the overall most preferred brand and the highest numerical value was the least preferred brand. The highest numerical value was based on the highest numerical value recorded between the big five brands in the UAE HVAC industry.

Preference of Brand	Numerical Value
COMPANY X	97/163
TRANE	106/163
YORK	147/163
DAIKIN	157/163
SKM	163/163

Table 2: Customer preferred brands

In table 2, COMPANY X was the most preferred brand with TRANE coming in at a close second, YORK coming in at third, DAIKIN at fourth and SKM at last. However, SKM coming at last place does not mean that this is the least preferred brand. SKM is a multi-million-dollar company in the UAE and 9 out of the 55 surveyed customers, ranked SKM as their most preferred brand. In the surveyor's opinion, when asking the customers about their most preferred brand in HVAC, and the surveyor lists four international multi-million-dollar companies and compare them to a local multi-million-dollar company, there might have been some unconscious biased towards the choosing SKM over the other international brands. For example, if one was to say, which is the better car in UAE, a Mercedes or Toyota, surveyed subjects can lean into the Mercedes, but people who think long terms take into consideration, repair cost, maintenance cost, reliability and re-sale value.

Analysis of past projects:

Looking into past projects is a crucial step into determining what is the cooling requirement COMPANY X most order/quote for in the market. This will help COMPANY X give a brief analysis of what cooling range COMPANY X need to focus on getting higher quantities.

S#	Chiller Model	Tr	Length (mm)	Width (mm)	Height (mm)
1	CHLR250KW	77.5	3,604	2,253	2,297
2	CHLR300KW	84.79			
3	CHLR350KW	92.38			
4	CHLR400KW	111.3	4,798		
5	CHLR450KW	125.67			
6	CHLR500KW	140.87			
7	CHLR600KW	174.1	7,186		
8	CHLR700KW	188.32			
9	CHLR750KW	206.16			
10	CHLR800KW	224.09			
11	CHLR850KW	234.56			
12	CHLR900KW	245.43			
13	CHLR1000KW	274.31	8,380		
14	CHLR1100KW	320.37	9,574		
15	CHLR1200KW	357.93	10,767		
16	CHLR1300KW	378.98	11,962		
17	CHLR1400KW	410.28			
18	CHLR1500KW	423.93	13,157		
19	CHLR1550KW	436.17	14,372		
20	CHLR1700KW	479.7	16,760		

Table 3: Chillers in COMPANY X product range

From the above table 3, there are 20 chiller models in the chiller family range that COMPANY X can use, however, ordering all these units is not a viable solution, especially if customers are looking for solutions like temporary cooling. COMPANY X need to ensure is that models ordered can perform the cooling requirement from customer and if an oversized chiller is rented to the customer, then using the chiller software, COMPANY X can limit the chiller to work up to part load, so that the minimum cooling range can be met and that the oversizing of the chiller will not harm the chilled water network. This way COMPANY X can limit the fleet models to only 10 models. However, by using two chillers to cover for high cooling capacities ranges,

COMPANY X can limit fleet to the following chillers in table 4, with the following cooling capacity range.

S#	Chiller Model	Tr	Length (mm)	Width (mm)	Height (mm)
1	CHLR350KW	77.5 - 92.38	3,604	2,253	2,297
2	CHLR500KW	95 - 140.87	4,798		
3	CHLR900KW	141 - 245.43	7,186		
4	CHLR1000KW	247 - 274.31	8,380		
5	CHLR1100KW	276 - 320.37	9,574		
6	CHLR1200KW	321 - 357.93	10,767		

Table 4: Chillers to meet the cooling capacity range

The cooling capacity for the 4 chillers between the cooling range 245Tr – 357Tr will be ordered and same logic as the chiller CHLR350KW and CHLR500KW chillers cannot be applied due to t he pipe size and sequencing loading and off-loading of the chiller compressor which can damage the chiller and leave the company with more repairs than profit. Unfortunately, to prevent leak in critical proprietary company information, the project data will not be presented in the paper. However, through data analysis was performed for projects since 2016, the cooling capacities were listed out for each year. Now, it is safe to assume that COMPANY X will not order a large amount of chillers, COMPANY X will limit the number of chillers to a total range of 40-50 chillers. Table 5 is the final quantity that will be ordered for the UAE pilot program.

S#	Chiller Model	Qty
1	CHLR350KW	10
2	CHLR500KW	10
3	CHLR900KW	7
4	CHLR1000KW	8
5	CHLR1100KW	8
6	CHLR1200KW	7
Grand Total		50

Table 5: Quantity of the chillers to participate in the pilot program

The proposed chillers will be ordered, and old chillers will must not utilized. This is to keep the pilot program in a controlled environment and will help COMPANY X get a proper analysis of how many times the equipment will need to be maintained, and limit the amount of breakdowns the chiller will face.

The chillers being ordered by COMPANY X factory will be equipped with additional add-ons for the safety and protection of the equipment, COMPANY X staff and customer. These add-ons have been chosen carefully in collaboration with the technical team in the operation and department who are currently working on the field and given their input. Therefore, the following add-ons has been selected:

1- Compliance with UAE regulation:
- Description: Additional label on the unit with rated power input, rated current and EER following AHRI 550/590
- Advantages: Compliance with ESMA standard UAE 5010-5 :2014.

2- Low Noise Level:
- Description: Aesthetic and sound absorbing compressor enclosure
- Advantages: Noise level reduction

3- IP 54 control box Protection:
- Description: Increased leak tightness of control boxes.
- Advantages: Protects the inside of the electrical box from dusts and sand. In general, this option is recommended for installations in polluted environments.

4- US screw compressor:
- Description: Screw compressor made in Mexico.
- Advantages: Improves coil performance along with easy maintenance of the compressor.

5- Evaporator with aluminum jacket:
- Description: Evaporator covered with an aluminum sheet for thermal insulation protection
- Advantages: Improved resistance to aggressive climate conditions.

6- 21 bar evaporator:

- Description: Reinforced evaporator for extension of the maximum water-side service pressure to 21 bar.
- Advantages: Covers applications with a high water column evaporator side (typically high-rise buildings)

Analysis of Project Cost:

Please note: any cost indication for the equipment falls under proprietary information, and prices below are based on selling prices of the equipment and selling price of the rental equipment. The percentage of mark-up increased is constant so the payback period will be the same.

By doing the cost analysis, COMPANY X first need to determine what are the costs involved with the entire model, or specifically the pilot program. The summation of these cost will be indicated as *x* as indicated in table 6:

- Cost of the chillers
- Cost of maintenance for the chiller/s
- Cost for installing the chillers every 12 months.
- Cost of hiring dedicated service team for the fleet (5 persons)
- Logistics (fleet storage)

The summation of the following costs will be indicated as y as indicated in table 7:

- Renting the chiller/s for a period of 1 year.
- Installing the chiller/s

Utilizing the total of both, COMPANY X can calculate the expected payback period by using the following formula:

$$\text{Payback period} = \frac{\text{Total project cost}}{\text{Expected yearly revenue}}$$

Unit Model	Qty.	Unit Price (AED)	Total Price (AED)
Chiller: CHLR350KW	10	272,568	2,725,677
Chiller: CHLR500KW	10	328,922	3,289,225
Chiller: CHLR900KW	7	443,345	3,103,413
Chiller: CHLR1000KW	8	469,346	3,754,765
Chiller: CHLR1100KW	8	552,322	4,418,574
Chiller: CHLR1200KW	7	604,291	4,230,038
Dedicated Team	1	153,846	153,846
Yearly Maintenance	1	1,923,077	1,923,077
Installation costs	50	461,538	23,076,923
Logistics	3	512,821	1,538,462
Total Price for Replacement portion		4,337,460.16	48,214,000

Table 6: Breakdown cost for the pilot program

Unit Model	Qty.	Unit Price (AED)	Total Price (AED)
Cooling Capacity: 77.5 - 92.38 Tr	10	276,923.08	2,769,231
Cooling Capacity: 111.3 - 140.87	10	323,076.92	3,230,769
Cooling Capacity: 141 - 245.43	7	369,230.77	2,584,615
Cooling Capacity: 247 - 274.31	8	523,076.92	4,184,615
Cooling Capacity: 276 - 320.37	8	646,153.85	5,169,231
Cooling Capacity: 321 - 357.93	7	769,230.77	5,384,615
Expected yearly revenue		2,907,692.31	23,323,077.00

Table 7: Breakdown of annual revenue of renting chillers

Payback period= $\frac{48.214,000.00}{23,323,077.00} = 2.06\ Years$

It would take approximately 2.06 years to recoup the investment. The above cost scenario is subject to installation of chiller in a different location every 12 months. If a policy is implemented, mandating to customers that minimum rental period must be for a period of 3 months, installation cost will reduce to 153,846.00AED per chiller, cost of the total project will decrease as per table 8 and ROI will also decrease to **1.4 Years**.

Unit Model	Qty.	Unit Price (AED)	Total Price (AED)
Chiller: CHLR350KW	10	272,568	2,725,677
Chiller: CHLR500KW	10	328,922	3,289,225
Chiller: CHLR900KW	7	443,345	3,103,413
Chiller: CHLR1000KW	8	469,346	3,754,765
Chiller: CHLR1100KW	8	552,322	4,418,574
Chiller: CHLR1200KW	7	604,291	4,230,038
Dedicated Team	1	153,846	153,846
Yearly Maintenance	1	1,923,077	1,923,077
Installation costs	50	153,846	7,692,308
Logistics	3	512,821	1,538,462
Total Price for Replacement portion		4,029,767.85	32,829,385

Table 8: Breakdown cost under 3 month minimum policy

Payback period= $\frac{32,829,385.00}{23,323,077.00} = 1.407\ Years$

Therefore, it is safe to say that the model is viable with astounding results and generous payback. Taking into consideration that, expected lifetime of the chiller in the UAE is approximately 15 years under standard conditions and 30 years under conditions that equipment is very well maintained, COMPANY X can expect the following revenue as indicated in table 9, with a generous long-term yield with just the 50 chillers in this business model fleet.

	Time Period	Forecasted revenue (AED)
Initial Cost	**1st Year**	23,323,077.00
	15 years	349,846,155.00
	30 years	699,692,310.00

Table 9: Forecasted revenue for the business model

Time Period	Forecasted revenue	Initial Cost (AED)	Yield (AED)	Yield (%)
1st Year	23,323,077.00	48,214,000.00	- 24,890,923.00	-52%
15th Year	349,846,155.00	48,214,000.00	301,632,155.00	626%
30th Year	699,692,310.00	48,214,000.00	651,478,310.00	1351%

Table 10: Expected yield from the business model without the policy

Time Period	Forecasted revenue	Initial Cost (AED)	Yield (AED)	Yield (%)
1st Year	23,323,077.00	32,829,385.00	- 9,506,308.00	-29%
15th Year	349,846,155.00	32,829,385.00	317,016,770.00	966%
30th Year	699,692,310.00	32,829,385.00	666,862,925.00	2031%

Table 11: Expected yield from the business model with the policy

Gantt Chart for implementation:

The following are the tasks needs to be implemented till the end of the pilot program where COMPANY X can determine if the pilot program is a success or failure. Table 10 is indicative of the tasks and duration of each task while figure 1 is the Gantt chart all the way to final analysis.

Task	Start date	End Date	Duration (Days)	Status
GM Approval	11/18/2022	11/24/2022	6	Done
Chief of Finance	11/25/2022	12/1/2022	6	Done
Aftermarket Approval	12/2/2022	12/8/2022	6	Done
GCC President Approval	12/9/2022	12/15/2022	6	Done
Local Partner approval	12/16/2022	12/21/2022	5	Done
Placing of order to factory in France	12/22/2022	1/1/2023	10	Done
Manufacturing of chillers	1/2/2023	3/25/2023	82	Done
Transporting of chiller to UAE	3/26/2023	5/24/2023	59	Done
Hiring process for new maintenance team	2/17/2023	3/17/2023	28	Done
onboarding of new maintenance team	3/18/2023	4/18/2023	31	Done
Training of new maintenance team	4/19/2023	5/19/2023	30	Done
Training of new business model for Sales Team	5/15/2023	5/19/2023	4	Done
Start and progress of Pilot program	6/1/2023	11/30/2023	182	Ongoing
Final Data Analysis for mass implementation of the program	12/1/2023	12/31/2023	30	

Table 12: Tasks to be accomplished for pilot implementation

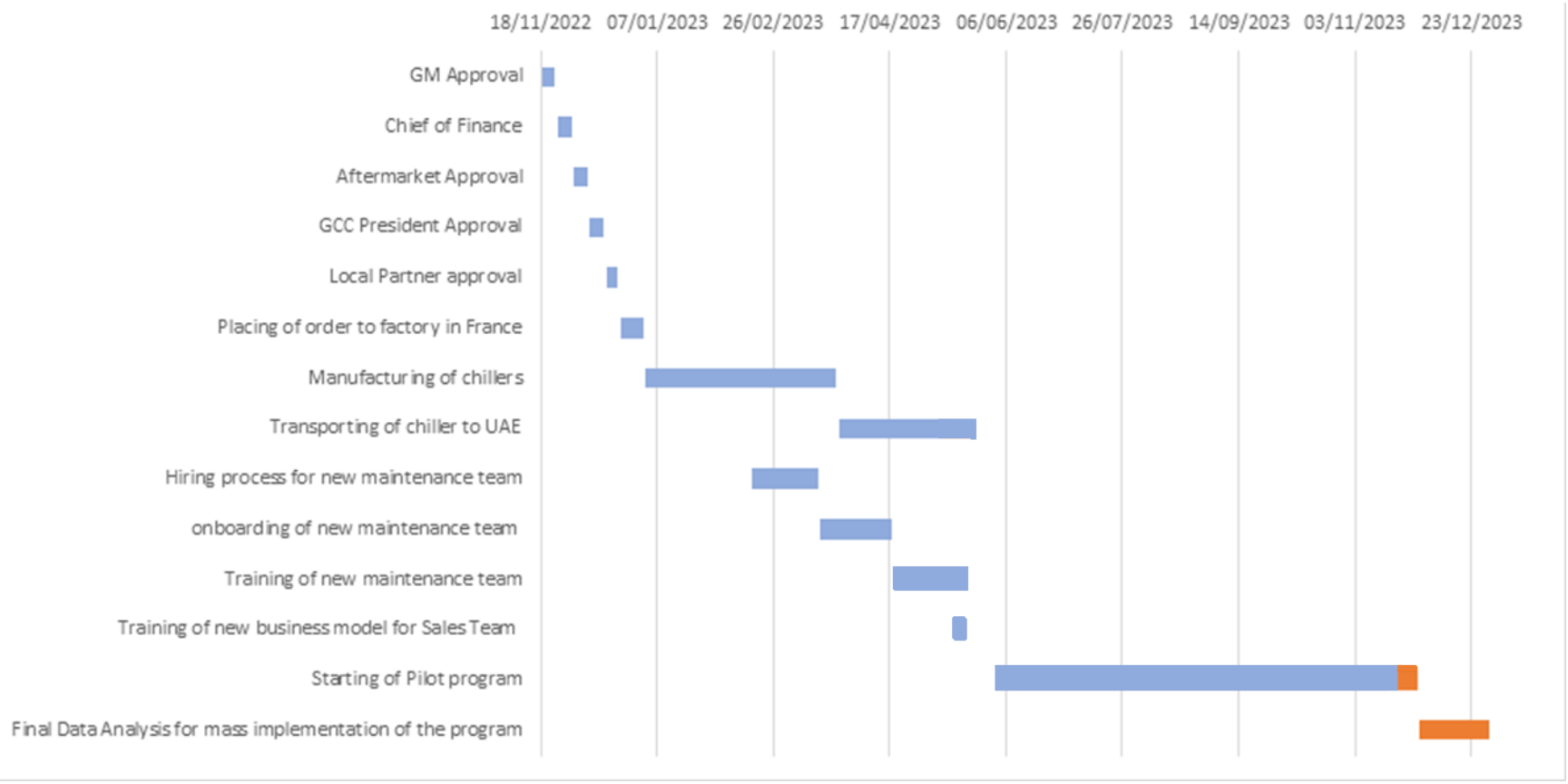

Figure 1: Gantt Chart for Tasks to be accomplished for pilot implementation.

On-going

Currently completed

Section 4

Existing Market Analysis:

After conducting comprehensive market research and interviewing ex-employees and consultant coverage team across the UAE, three major players in the market have been identified: TRANE, YORK, and Carrier. It is noteworthy that TRANE and YORK have already implemented this business model, which helps them promote and generate additional revenue.

The research interviews shows that the current market share for rental chillers is estimated to be around 50 million dirhams, with TRANE capturing only 8%, YORK coming in second with a total market share of 24%, and other subcontractors who COMPANY X is currently utilizing taking up a significant share of 44%.

It is clear from the interviews with various companies, managers, and existing market players that the remaining 8% of the market is untapped. However, if left unaddressed, this share is likely to be dominated by other subcontractors, increasing their market share to 60% by the end of 2025.

The market presents a promising opportunity for rental companies to grow their business, and COMPANY X can now compete with the same prices that everyone else in the market is offering, making it a viable option. This is a significant departure from the industry perception that COMPANY X is known for being the most expensive in equipment replacement. By undertaking a high initial capital cost, which can be covered almost immediately, tapping into this market and competing with the other players is achievable. Figure 2 presents a comprehensive overview of the rental market in the UAE.

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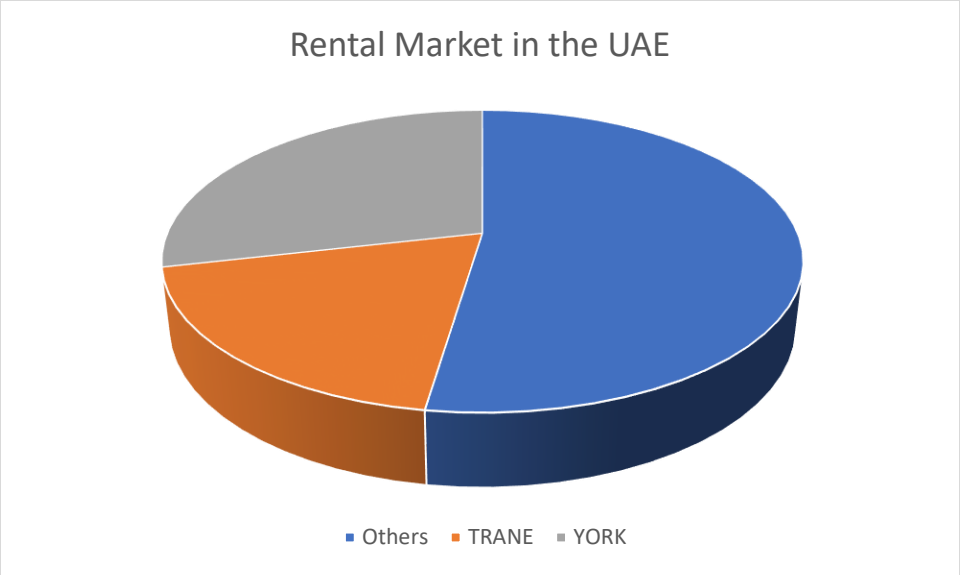

Figure 2: Rental market in the UAE

Potential Business:

With the implementation of the plan, COMPANY X will be able to provide the rental service and easily provide a yearly growth by 10% per year as shown in figure 3.

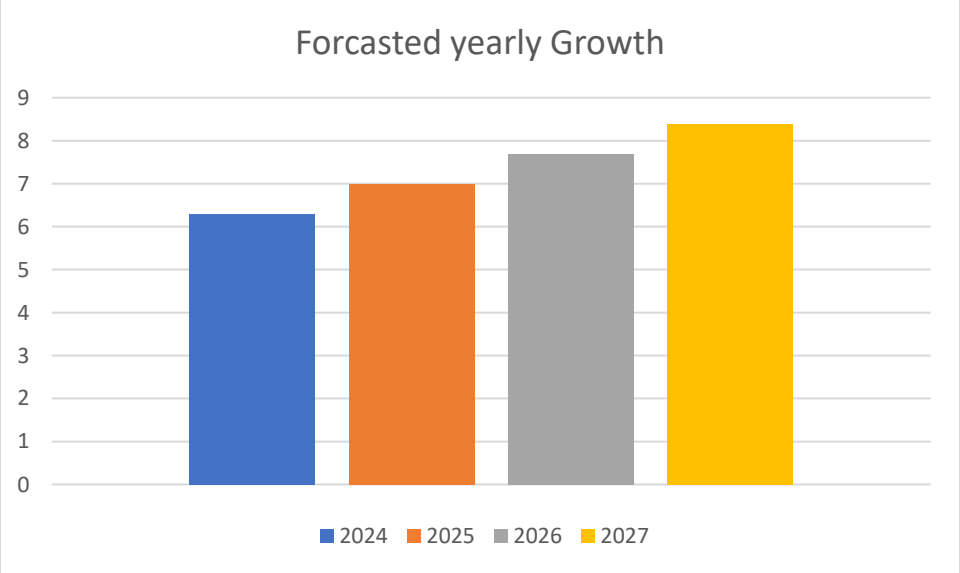

Figure 3: Forecasted yearly revenue growth

Process Cycle:

Many members of the sales team have expressed concern about how to introduce COMPANY X's rental chiller service to customers. However, the survey results indicate that there is a clear need and desire for this service among customers. By simply adding an additional layer to the company quote process, it can easily integrate rental chillers into their projects.

The aftermarket department consists of three core services: replacement, repair and maintenance contracts. The process for each of these services is quite similar. The current process involves the customer approaching COMPANY X sales team, COMPANY X sales team requests purchase team for a proposal from pre-approved vendor, approved vendor visits the site, the vendor provides COMPANY X purchase team with a proposal, COMPANY X team adds all required policy costs and margins and proposes it to the customer as an official offer. Figure 4 shows a rough skeleton diagram of the internal process with a lead time of one week from Customer enquiry to submission of official proposal from COMPANY X.

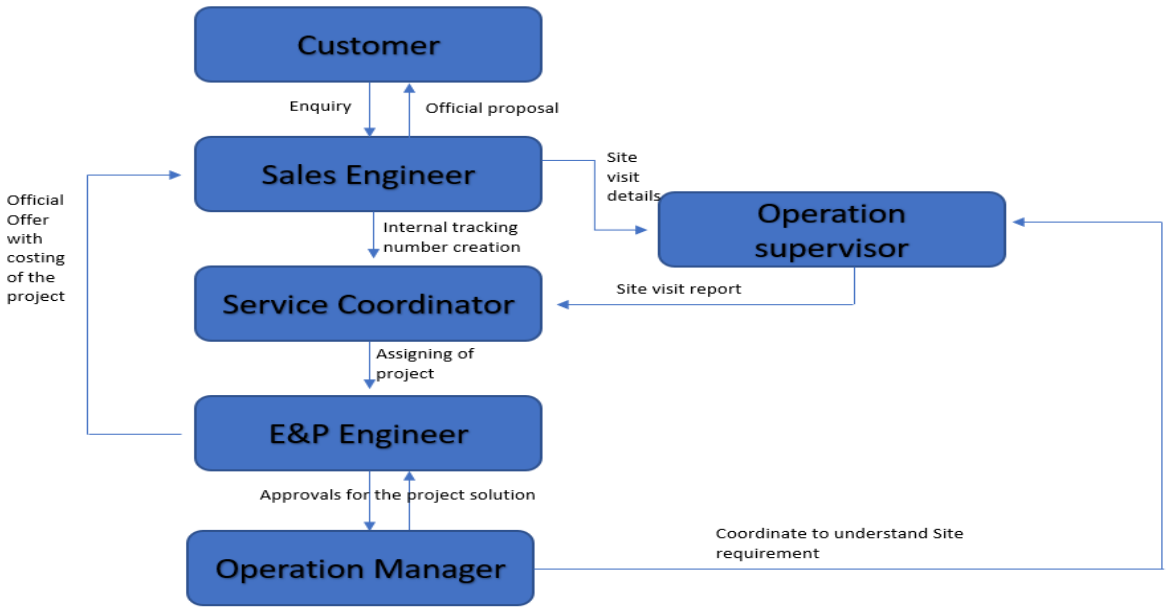

Figure 4: Current process for all enquiries

When a chiller rental inquiry is received, the process is slightly different. The operation supervisor is replaced, and the site details are forwarded to the purchase team, who then sends an approved sub-contractor to the site to determine the cooling capacity requirements. Figure 5 provides a breakdown of this process.

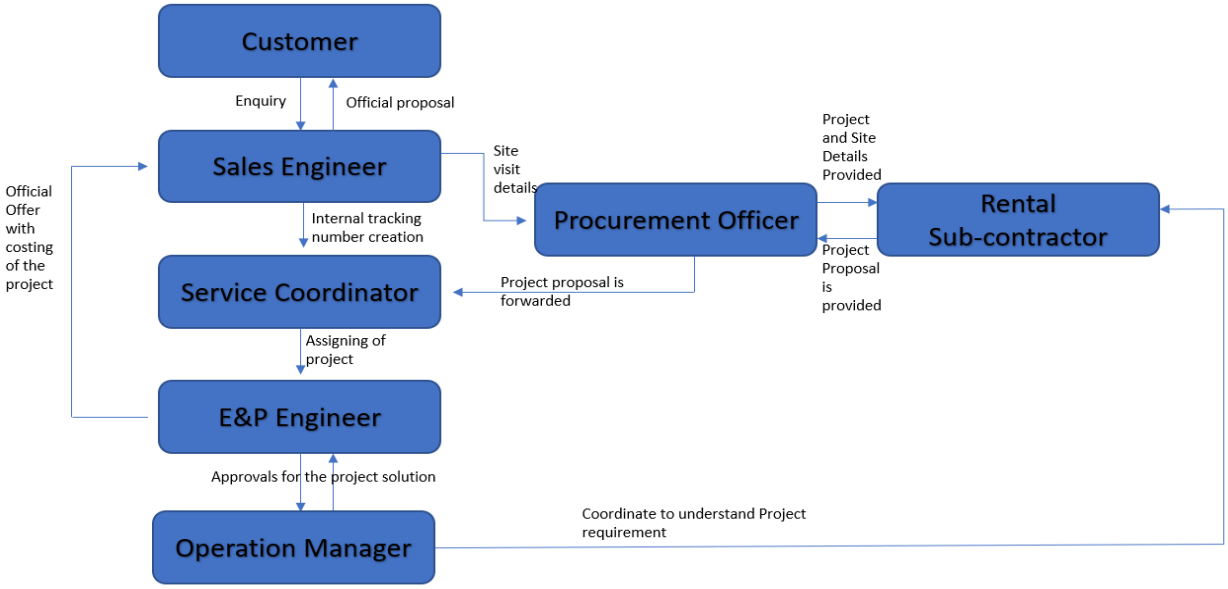

Figure 5: Current process for rental enquiries

Under the current process, the main issue is that the approved sub-contractors are under on legal obligation under COMPANY X and so, can approach the customer directly and under-quote COMPANY X.

Three solutions can be proposed for the above explained case:

1- Standard Rental chillers enquiry
2- Chiller rental for chiller replacement works
3- Emergency Rental chiller for breakdown of customer chillers

Standard Rental chiller enquiry:

With the standard rental enquiry, COMPANY X can follow the same process as figure 4 and even expedite process time. The standard rental enquiry process includes customer approaching COMPANY X for rental chiller and COMPANY X sales engineer sending operations team to site and then working with E&P engineer to provide a rental proposal to customers. There will be no change in the current process. The operation supervisor is still involved in this process as one of the primary roles of the supervisor is to ensure that the site is EH&S (Environmental, Health and safety) compliant.

Chiller rental for chiller replacement works:

In the current process for the replacement of chillers, once the customer finalizes the project COMPANY X will order the chillers which normally takes a lead time of 12-14 week. However, due to the current logistics crisis the timeframe for the chillers to arrive in the UAE has drastically increased to 18-20 weeks, as per discussion with the Chief Regional Procurement Officer and France factory, it is expected to increase to 22-24 weeks. Therefore, an initiative can be imposed to implement rental chillers for 6-month period where it takes the chillers to reach the UAE, for customers looking to have a immediate cooling solution. The current process is once again going to be utilized. However, during negotiation of the project, sales team can propose this solution to the customer and ask them if they would be interested and since the site is already inspected by the operations supervisor, COMPANY X can immediately provide the cooling capacity requirement for the customer and reduce the lead time for answering to the customers.

Emergency Rental chiller:

It is important to note that companies may not always have sufficient funds to service or repair their equipment. Instances have been observed where owners have been using equipment that is over 20 years old, with years of wear and tear and no maintenance, and suddenly require repairs when the equipment breaks down. However, even if the customer confirms the order on the same day, parts may have a lead time of 6-8 weeks, which is further increased to 8-10 weeks due to the current logistics crisis. Leaving the customer without cooling is not a viable option, therefore, a suggestion to rent chillers temporarily is proposed. By having a self-owned fleet, COMPANY X can provide a bulk solution from the services it already provides, offering temporary cooling to customers until the parts arrive. This approach will help COMPANY X meet customer expectations and increase overall customer satisfaction.

Section 5

Conclusion on business viability:

Regarding the business viability of renting chillers, it is noteworthy that this is a niche market with great potential. Analysis of the payback period suggests a payback period approximately 2 years, indicating that this is a feasible project to undertake. Moreover, adopting the rental chiller business model has the potential to enable effective cost management while maintaining discretion towards sub-contractors, thereby mitigating the under-quoting process that could negatively impact customer relations for COMPANY X. It is also pertinent to highlight that at COMPANY X, the operations team receives comprehensive training encompassing a broad range of tools, complemented by hands-on experience with operating models during training sessions. To qualify as part of the operations team, newcomers must complete these training modules under the guidance of the operation's technical manager. Additionally, implementing the rental chiller business model could further provide an opportunity for an additional training program that exposes the operations team to real chillers before they enter field operations.

But what would happen is this completely fails to make COMPANY X any profit? The main reason where an undertaking like this would fail is if the demand has died, and that is impossible to see happening in the GCC where the need for HVAC is a necessity, not a luxury. In the worst-case scenario where the model fails to yield the expected results with the pilot time frame, COMPANY X can cut their losses and sell the chiller equipment as they are relatively new and the replacement team in the aftermarket department can sell it to the customer for a third of the standard asking price and still be profitable.

However, in the unlikely event that the rental chiller business model fails to yield expected results during the pilot timeframe. Currently, the project is in the pilot program and the data and results collected are within expectations so far, COMPANY X is currently working with the existing customers base and is currently in talks with a real estate development company to be the sole distributors for rental chillers. The analysis team is waiting for the results of November before the final verdict can be given out but has safely informed that the results of October will be replicated during the month of November and the pilot program is by far a success.

Section 6

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Appendix:

Objective:

COMPANY X is trying to determine if introduced, will the market have a requirement for rental of chillers.

1) Which industry is your company involved in?

☐ Commercial ☐ Digital/IT ☐ Education

☐ Food retail ☐ Healthcare ☐ Hospitality

☐ Government ☐ Marine ☐ Manufacturing

☐ Residential ☐ Retail

☐ Others (please specify): .....

2) If given the option of renting of chillers, would you as a business/building owner be interested in this service?

☐ Yes ☐ Maybe ☐ No (please clarify): .....

.....

3) What payment terms would you prefer as a business partner if rental of chillers is open as an option for your business/organization?

☐ Monthly in advance

☐ Monthly in arrears

4) If your requirement was in need to rent chillers, please rank the order of preference of which chiller you would be most likely to rent. [1 being most likely and 5 being least likely].

☐ COMPANY X ☐ TRANE ☐ YORK

☐ DAIKIN ☐ SKM ☐ I don't care about the brand of the chiller.

☐ Others (please specify): .....

Thank you.