Laundromats in Bangkok Real Estate Centric Services an Industry Emerging in Response to Covid-19

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

Original Research Article

ABSTRACT

Aims: This study tried to capture the perception of laundromat customers in Bangkok, Thailand towards the end of the historic and unsettling Covid-19 crisis for washing and drying purposes in terms of process, physical evidence, and people components of the service marketing mix, in addition to product, price, place, and promotion.

Study Design: This is a grounded theory study in nature that explored the users' perceptions of coin-operated laundries through structured interviews that were captured on questionnaires.

Place and Duration of Study: Various types of automated laundries in Bangkok, Thailand during the end phase of the Covid-19 pandemic between March 2022 and December 2022.

Methodology: We included a random sample of 200 respondents (33% male and 67% female; age range 11 to over 80 years), students, housewives, employees, and retirees who used self-service laundries of various types for washing and drying as well as other services.

Results: Very important for the process are comfort and atmosphere together with cleanliness and safety (Mean 3.48, SD 1.31, r = 0.529). The physical evidence mentioned location in terms of access and the facility itself (Mean 3.54, SD 1.11, r = 0.650). The customer mix was the most important people component with few and only occasional staff in the vending business. (Mean 3.31, SD 1.27, r = 0.619).

Conclusion: The study concluded that the COVID-19 pandemic was the initial spark needed to start Bangkok's rapidly growing laundromat businesses. The industry grew so fast in Bangkok that the next target is the remainder of Thailand. Successful entrepreneurs in this industry will have a keen awareness of the location, process, physical evidence, and social components of their customer service-oriented highly automated SME.

Keywords: Architecture; Bangkok; Covid-19; coin-laundry; coin-operated laundry; entrepreneurship; facilities management; franchising; interior design; laundromat; launderette; lavanderia; self-service laundry; service marketing; small business; vended laundry; washateria; wash salon; wet cleaning; Thailand.

1. INTRODUCTION

Covid-19 changed all our lives and business as we knew it. Many industries, like hospitality and tourism, were negatively impacted and almost brought to a hold. At the same time health and hygiene-related businesses experienced a boom when on March 11, 2020, the World Health Organization (WHO) declared coronavirus a worldwide pandemic. The recommended preventive measures included wearing masks, physical distancing, washing hands regularly, and washing laundry more frequently. In a country like Thailand, it often means washing clothes by hand as not every household has a washing machine, or can afford to purchase one. To meet the increasing demand for personal hygiene laundromats started to pop up almost overnight in Bangkok. The global laundromat machine market was valued at US$ 4.23 billion and it is estimated to grow to a CAGR of 6.6% from 2022 to 2031 and reach US$ 7.96 billion by the end of 2031. Laundromats are establishments with coin-operated washing machines and dryers for public use on a fee basis. A laundromat is predominantly a self-service laundry, and the service mark Laundromat was formerly a U.S. registered trademark like Xerox. In contrast, laundromats existed in the USA for decades and in Germany since the end of WWII as so-called wash salons (German: Waschsalon). The operation is fairly simple customers bring their dirty clothes, load them into the machines, add detergent, and then insert the required coins or tokens to start the washing cycle. The patrons either wait in the laundromat until the washing cycle is completed and in the meantime watch TV, chitchat, read, play games, use social media, or leave the laundromat and come back later. The issue often is to have the correct change for the machines this is where a coin changer can help. Also, not all customers bring their detergents and softeners instead purchase them onsite in load-size quantities. Coin-operated washers and dryers come in various sizes (8-20 kg) to take care of various wash loads such as clothing and bedcovers. Some laundromats provide only washing machines and no dryers. Among the washing machines, there are differences in front and top-loaded units. Front-loaders are typically more expensive, their advantage is that they can be easily stagged. Single units usually have washers with dryers on top, or in condo settings, there may be an air-conditioning unit over the washer which limits access from the top. Frontloading washers have the disadvantage of being difficult to open during the wash cycle. But top loaders are the most popular in laundromats. Top loader can be stopped at any time and forgotten laundry pieces can be added or taken out. It also allows for detergent, bleach, and softener to be added at any time. Top-loaders are more popular in Thailand and also cheaper almost half the price of front-loaders. Part of the reason for the lower price of top loaders is that they usually don't have a water heater. This brings us to the next variable in the cost of doing laundry – water temperature. Tab water at room temperature and hot water generated by a water heater inside the washing machine. Some laundromats have extra water filters and water-softening systems. In general the warmer the water the more expensive the service. The same holds true for the size of the washing machine the larger the load the higher the price. While initially the machines were operated by coins or tokens, now credit cards, debit cards, and virtual payment forms entered the industry. Some laundromats also offer additional services such as ironing and dry cleaning as well as folding of cloth and cleaning of fashion accessories such as brand-name handbags.

Laundromats offer vital services for many people at specific points in time of their lives, whether they are university students, singles, young couples, divorcees, transients, living in apartments, or other forms of multi-family housing. In general, renters are more likely to

utilize laundry services than home or condo owners. As of 2019, around 36% of US households were renters, and these are essential to the business of laundromats. Moving washing machines from one rental to another is often inconvenient. Also, lower-income earners rely more on coin laundry as they do not have the money to cash purchase or even finance a washer and dryer therefore some segments of the population use self-service laundry throughout their entire lives, especially in urban areas. While rural areas of Thailand are more likely to handwash. The growing urban population is helping the laundromat business. The more affluent customers only clean larger items like blankets, duvets, coats, wall coverings, and carpets that may not fit in the smaller household washing machines. The growth of college education is one area where economic growth can be good news for this industry. Students living on campus are reliant on laundromats, and rising student numbers benefit laundromats serving this sector. Establishing a business near a college campus or in a student-heavy neighborhood can be a good move when setting up one of these businesses. But during covid-19 universities delivered courses online and foreign students especially from China were not able to return to campus. Campus laundries were especially hard hit during Covid-19.

Crimes are an issue and range from petty theft, and vandalism, to violent crimes like assault, rape, and murder. Staff used to be the answer but the staff became often a victim of crime themselves or even committed them. Security guards were not uncommon in the past who may have assisted with the operations such as collecting the money or doing small repairs and cleaning. Vending machines were often the target of misdemeanor crimes from stealing laundry, either female underwear or high-value designer jeans and other clothing items. The cash in the vending machines attracted other types of criminals who may have been in dire need of cash often for drugs. The solution is tokens which are being used in the individual

washers and dryers and the cash is collected in the money changer machines which can be in a strongbox for protection which helps to harden the target and deters juvenile delinquents and small-time theft. In general, the move is from expensive security guards who often were part of the crime ring to neutral alarm systems and video surveillance.

The most important decision in the laundromat business is location, location, location as in any real-estate venture. Laundromats are commonly found in urban areas or neighborhoods with a higher population density, as they cater to individuals or families who live in multifamily housing like apartments or small homes without in-unit laundry facilities. Condominium property management companies and the owners of apartment buildings turn to coin laundries as a way to serve their tenants on the premises. In this case, parking is a lesser issue as parking is provided by the property and patrons take the lift to the laundry room Parking can be a critical issue in certain settings where customers need to drive to the facility by car, motorbike, or bicycle.

Some laundries might have attendants on-site to assist customers or to maintain the cleanliness and functioning of the machines as well as security, especially in 24-hour locations and locations that provide laundry drop-off for dry-cleaning and full service as well as alteration services. In general automated laundries are exactly that automated and have no permanent staff. Repairs may be performed by the machine manufacturers or their dealers. Cleaning may be done by a maid stopping by certain times of the week. In Thailand, the laundromat owner is frequently also the property owner and may live upstairs or let one of his relatives live in the house who in return takes care of the property and looks after the interests of the proprietor and may perform most of the work himself from collecting the cash, cleaning the place and doing necessary repairs.

Fig. 1. Coin-Laundries in Bangkok, Thailand

Historically, laundromat businesses have seen a 95% success rate, but whether this continues will depend upon broader demographic trends and patterns of washing machine ownership especially in Thailand. The current economic uncertainty after COVID-19 and the election has some advantages for the laundromat industry, as more people may stay in rentals while they wait to see how the property market shakes out after the pandemics. But broader economic prospects currently look reasonable, which should mean recovery for the housing market, and as more people buy their own homes, fewer will rely on laundromats. This trend may be true for the USA but not for Europe and definitely not for Thailand and ASEAN. However, the trend away from the large rural family living together to smaller urban family units will increase the use of self-service laundries.

Revenue mostly comes through the use of coin-operated machines, though other payment methods have started to be introduced. Sales of laundry detergents and dry-cleaning services can provide varied revenue streams, but the core business is always self-operated washers and dryers. The net operating income can be verified through three methods, checking documents like bills, bank statements, and income tax returns, and checking utility usage mostly focuses on water and secondarily on electricity. The third method is counting coins every two or three weeks. The best is if the buyer and seller count together and count per washing machine as there are differences in size and degree of maintenance. Naturally, sellers can put extra coins in and can let the water run to make it look like there is more business than there really is, and electric meters can be manipulated too.

Depreciation, purchases, and rising utility bills all contribute to keeping industry profits down. Washers have to be replaced every 5 to 15 years, dryers after 10 to 15 years, and most facilities in the USA have between 40 and 100 machines while one to ten in Thailand. This means that costs increase once a laundromat has been established for a few years and equipment starts to wear out. The capacity of the machines has a significant impact on profits, so it is well worth paying more for equipment that will bring bigger returns, but this adds to the costs for repair and replacement, as well as affects the size of the property you need for the business.

Many laundromats also offer additional amenities such as sinks with running water, folding tables, coin changers, token exchangers, seating areas, vending machines for candy, snacks, and hot and cold drinks like coke and coffee as well as vending machines for laundry detergents, softeners, and dryer sheets. Free Wi-Fi, background music, large TV screens, pay phones in the old days as well as alarm systems, security cameras, motion sensors, and very important fans and air conditioning create creator comfort to remove the humidity and heat to make it a space people want to hang out. Naturally, the decoration and ambiance need to match the target market segment. Customers expect plenty of electric outlets for charging their mobile devices or even chargers and charger cables.

2. LITERATURE REVIEW

The principal investigator (PI) conducted an in-depth literature review which provided us with the theoretical underpinnings for our study of laundromats in Bangkok. We not only reviewed the historical development of coin laundry to elaborate launderettes as they moved from the USA to emerging markets but also the various business models of laundries which vary as much as their architectural design. The literature review and the established preexisting models became the basis of our research which hopes to expand the existing body of literature. The study of the sociological aspects of soap shops goes back almost twenty years to Pratt, A.C.(2002).

The US laundromat industry in 2023 is worth $6 billion, down from a peak in 2018, when it was worth nearly $6.5 billion. Since then it has declined by an annual average of -1.4%. Some of this decline was influenced by the economic impact of Covid19 especially in the early days when more people switched to washing at home. The launderette industry has seen some growth since its low point of $5.8 billion in value in 2020, but it is still only expected to grow by 0.1% in 2023. The industry employs nearly 53,000 people in over 19,300 businesses according to planetlaundry.com the monthly magazine of the USA Coin Laundry Association and is written specifically for today's self-service laundry owners, operators, managers, and potential laundry investors. Coin laundries operate all across the US, clustering in urban areas with their large customer bases. Historical growth ended several years ago before the COVID-19 pandemic. More privately owned machines and the squeeze of running costs are impacting profits. Increasing urbanization helps to maintain the customer base but isn't creating the rise in

demand that might have been expected. But with profit margins falling, the industry is going through a period of consolidation and closures, not expansion. Worldwide the leading laundromat machine manufacturers are LG, Alliance Laundry Systems (ALS), GE, EDRO, BOEWE, Electrolux, Ramsons India, and Whirlpool (statista.com). The manufacturers are working on more environmentally friendly machines that use less water and less electricity through inverter technology in other words doing a better job in less time with lesser amounts of detergents while switching to green environmentally friendly laundry detergents.

In Germany, the launderette business was introduced by the US forces stationed in Germany while soldiers and their families were looking for laundry services on base. Laundromats also started in the German civilian economy off base. In Germany, laundromats usually are not 24/7 operation most frequently they only operate Monday to Saturday 06:00-23:00 Uhr with the last coin to be accepted at 23:00 the price for a normal load is around 3,50€ while some laundromats offer a discount from06:00-10:00 Uhr of 2,50€ XXL loads cost around 11,00€ and 15 minutes drying 1,50€ detergents for one load costs around 0,50€ many places also accept debit and credit cards. Eco-Express Eco Express Laundry Systems GmbH. (https://waschsalon.de) SB-Waschsalon is another chain of laundromats throughout Germany (https://waschsalon.expert). Sigüenza CP, Cucurachi S, Tukker A. [1] explored the circular business models of washing machines in the Netherlands.

While the laundromat industry in the USA seems to have plateaued. In Thailand, 1,150 new laundromats are to open in 2023 750 of them will use ALS products. This is an increase of 30% to a total number of units of 4564 of which 2916 are ALS. Alliance Laundry Systems (ALS) is the leading manufacturer of laundry equipment worldwide with over 2,500 employees ALS was founded 1908 by Barlow und Seelig with HQ in the USA and manufacturing facilities in the USA, Czech Republic, and Thailand. Today ALS has over 1,000 distributors in 140 countries. In Germany and the USA ALS is well known under the brand name Speed Queen. ALS reported a sales revenue of 47 billion baht in 2022. ALS was established in Chonburi in 2017 a factory producing 25,000 units a year for the growing Asian market. Commercial laundries and on-premise laundries along with laundromats, in

main tourist locations, provide the biggest opportunity for changing consumer behavior. Post-pandemic consumers got a better understanding of the laundromat business. The goal is to have at least one laundromat in every district or in Bangkok in every subdistrict within the next five years.

Laundromats are unusual for small businesses (SMEs) because they occupy retail spaces but don't have significant inventory or deliveries to deal with. This removes one complication for the owner of the business and leaves you with one less significant issue to deal with. However, the constant use of the machines means that extra work has to be put into maintenance, repair, and cleaning, and it's important to have access to staff with the skills to do this [2]. Other than machine maintenance, cash collection, and bookkeeping, costs relating to staff are minimal, as customers operate the machines themselves. Coin/card-operated laundromats are consistent high-return investments. Laundromats in the USA see an average cash-on-cash return on investment (ROI) of 20-35% and many investors break even in as little as six months much higher than most alternative investments. And when you factor the flexibility and low labor costs, laundromats just make sense for small business owners with a nearly 94.8% success rate. All the benefits of a profitable investment—without all the risks. Enjoy the flexibility of running your laundromat the way that fits your lifestyle. In many countries, you can write off equipment purchases and claim equipment depreciation as a loss on your taxes. Your machines do the work so you don't have to. In fact, 70% of laundromat investors have 0-3 employees which results in low labor costs. Customers pay upfront using cash, tokens, or a payment app with digital cash or credit cards, meaning laundromats don't incur the cost, time, and hassle of many other investments' accounting requirements. The key to buying a laundromat is doing proper due diligence. It is critical to have the right information about the business and make a proper valuation based on that information. Being off just $500 per month could mean overpaying by $20,000-$30,000. It's not hard to do. The laundromat can be franchised, operated under a licensing agreement, or simply started as a small business by buying equipment off the shelf from electronic shops, shopping malls wholesalers, or department stores like Big C, Lotus, or Makro. Laundry costs of machines as well as operating expenses and revenue are usually calculated per kg of laundry.

Fig. 2. Laundromats in Bangkok, Thailand

Location, location, location, or place as we call it in the marketing mix. It all depends on the right neighborhood. Usually, we are looking at areas where 35% roughly one-third of the population rents rather than owns. Small households but larger families with more children are normally more profitable. Most people will simply use the nearest laundromat to them, out of convenience and time saving – 87% of customers live within a mile of the laundromat they use. Location is therefore critical to a laundromat's success or failure and should be the biggest concern for anyone considering a laundromat franchise. The best branding in the world won't help your laundromat business if you set up in an area where everybody has their washing machines. The upside of this is that you don't have to grapple with retaining customer loyalty – 90% of customers become repeat users because the location is so important and unchanging. Underhill, Paco [3] Why we purchase in the science of shopping. Checking what established competition you might face is vital to judging the potential in a laundromat. Gilch, Nele und Schinz, Petra [4] explored laundromats and the support they offer to the neighborhood as a give-and-take relationship.

The architectural features of the laundry facilities make the difference. The storefront can be critical too and needs to match the image of the target market. High-traffic laundromats typically have storefronts with high visibility, plenty of dedicated parking, or shared off-street parking, and are located near grocery stores, supermarkets, convenience stores, fresh markets, strip shopping centers, and gasoline stations. There isn't a lot that laundromats can do to stand out from one another, or to attract a larger customer base, beyond drawing attention to their existence. The color scheme and signage give the facility its corporate identity and help to build the brand for franchising as well. There are other architectural features related to landscaping, especially interior design. Most laundromats are not freestanding but occupy lease space [5]. The low end often has no specific design only security features to protect the machines and the cash on-premise. Seating areas are the most important together with layout tables and vending machines to provide additional services on the premises and according to Kenen R. [6] soapsuds, space, and sociability go hand in hand. Business architecture is a different meaning than the influence of architecture on the built environment and the business functions that take place [7].

The World Financial Action Task Force (ATF) feels that Thailand has fallen behind in tackling money laundering. Thailand failed to pass AMFL/CFT laws regarding anti-money laundering and combating the financing of terrorism laws. When it is time to do the laundry laundromats are the perfect industry for money laundering. That is probably also a reason why some laundromats will always operate on a cash basis. Most money is laundered with vending machines of all types in businesses such as car washes and laundries, ironically both businesses deal with washing. Any business with cash vending machines is ideal as Laundromats as shell companies, but this does not mean that every laundromat also launders money. In the literature the term laundromat is used for large-scale money laundering as in the OCCRP, The Russian Laundromat, published in August 2014, and available at https://www.reportingproject.net/therussianlaundromat/russian-laundromat.php. The Russian Laundromat was a scheme to move $20–80 billion out of Russia from 2010 to 2014 through a network of global banks, many of them in Moldova and Latvia [8]. Hawala is an informal

method of transferring money without any physical money moving. It is described as a "money transfer without money movement. It requires a network of hawaladars to transfer between different locations in town, the country, or even internationally. Restaurants and laundromats often serve as a front for these activities [9].

But laundromats not only come with the potential for white-collar crime but also more frequently attract criminal elements to their facilities. Safety and security are big issues in the public laundromat business. Crimes from break-ins and vandalization. Loitering and begging are other issues, which may even lead to some more serious crimes such as assault and rape not to mention murder. The Bookings Institute (2015) conducted a study, that analyzed crimes committed at or within a 50-foot radius of all Laundromats in L.A. County from January 1, 2014, to December 31, 2014, found that of the 2,417 crimes committed in the target area, 1,766 were allegedly committed by white people*. These crimes ranged from a double homicide in Monterey Park. to the theft of a single doily in Toluca Lake. The study, the first of its kind, also showed that Chinese, while traditionally associated with laundries, fared poorly, accounting for only 2.7% of total crime even though they made up 12% of the laundromat attendees/owners. Mexicans who comprise more than 71% of laundromat users, were suspected in only 5.8% of the crimes committed there. African American criminals were even less likely to commit crimes in a laundromat, accounting for only 1.3% of crimes. Change is the primary loot at laundromat crime, but it is not cool for a gang member to carry around a pocket full of coins, according to Stanford University professor Matt Baylick.

Laundromats are a special type of public space. Often a gathering place for the entire neighborhood, and so the laundry reflects the neighborhood and its residents. Laundromats are also community spaces as discussed in Maria Paulo Ghiso's paper "The Laundromat as the Transnational Local: Young Children's Literacies of Interdependence". In the old days, reading was the most popular way to pass the time while waiting for the wash cycle to be completed. In big cities like New York having a personal washer and dryer is quite possibly the ultimate luxury. Due to extremely tight living spaces and strict water-restriction laws, the majority of New Yorkers are forced to schlep their washing to the nearest Scrub 'n' Bubble according to Vogue magazine and the collaborative consumption study of Phuphisith S, Kurisu K [10]. Abdullah, Nuraisyah Chua; Rosnan Herwina; and Norzayana Yusof [11] explored the liability and legality of Muslims offering products or services exclusively for Muslims. Fischer CS [12] looked at laundromats as private public spaces. Zurcher LA Jr [13] looked at the customer protection of self in an encapsulated group

Thai laundromats are now at the risk of being hung out to dry after a 7-Eleven store rolled out its washing machine service, the latest service in its increasingly monopolistic grip on consumers' lives. The laundromat at a 7-Eleven convenience store in the Bang Phlat district of Bangkok was quietly introduced in December 2022. The coin laundry facility is being operated by a laundromat service called Otteri Wash and Dry. Otteri Wash and Dry has been in operation since 2016. It currently has 210 branches around Thailand. Washing services at the 7-Eleven store start at 40 baht for a load washed in cold water, 50 baht for warm water, and 60 baht for hot water. The dryer is 40 baht for a 30-minute run, with every additional 10 minutes an extra 6 baht. The CP Group pushes to turn its ubiquitous stores into a one-stop service for all aspects of life and laundry certainly fits right in, and it does not hurt that customers can do shopping while waiting for the laundry. While laundromat businesses have a local flavor some commonalities can be applied worldwide. Bhate, Hardik Jayesh and Shivdas, Avinash [14] analyzed critical success factors of laundromats in emerging economies like India. The nature of the business changed a little even so it developed a lot with the digital age. Technology can make the business easier to manage and can eliminate some of the pre-existing problems but may also change the very nature of the business model. (https://alliancelaundry.com/) The historic models serve as a benchmark for the newly evolving laundromats in Bangkok and soon all over Thailand serving both low- and high-end customers. Moon, Dami; Amasawa, Eri, and Hirao, Masahiko [15] focus on laundry habits in Bangkok and analyze the use patterns of products and services with a focus on sustainability.

Our study looked at the business models of low-end to high-end laundromats. The low end may be a single washing machine with a box collecting money in front of an apartment building or store. The high-end launderette includes air-

conditioning, seating areas, a layout table, free WIFI, and often a coffee shop and laundromat attendance who clean and repair the machines when needed and offer assistance down to ironing and folding services as well as alteration services and machine booking App [16] similar to the LIS app discussed by Gruenwald H [17]. Environmentalists agree that doing laundry in coin laundromats is more efficient than in individual household appliances which consume more energy and water and can also be noisy [18]. Wasserbaur R [19]. explored the quantification of the environmental impact of access-based consumption for household laundry activities. Our study focused on the perception of the customers in terms of physical evidence, process, and people according to the service marketing mix as the expansion of Kottler's original marketing model for products which includes, product, price, promotion, and place in terms of washing behavior [20].

3. METHODOLOGY

The study tried to capture the users' perceptions of laundromats on various critical dimensions. The research instrument has been developed by the primary investigator (PI) as a quantitative measurement of qualitative feedback in terms of the perception of the respondents. A paper-based survey instrument was developed by the PI and pretested according to the following ontologies, epistemologies, and methodologies described by Decrop A [21]. The customers of the various types of laundromats were interviewed by the researcher and the results were captured with paper-based and online

instruments in the form of questionnaires. Using an adapted grounded theory approach for inductive theory building following Sarker S, Lau F, Sahay S [22] the data was statistically analyzed. The researcher was keenly aware of common method biases as stated by Podsakoff, P. M., MacKenzie SB, Lee JY, Podsakoff NP. [23] he tried to mitigate them as much as possible in this study of laundromats in Bangkok, Thailand. The instrument used was based on that by Gruenwald H [7] developed for coworking spaces in Germany during the COVID-19 crisis as an example of architectural facility-specific services.

3.1 Population

The study included laundromats throughout Bangkok in both the affluent and less affluent neighborhoods. This provided the researcher with a good representation of the washeterias in Metro Bangkok. As other coin-laundry spaces in Bangkok are very similar to the ones visited, it is expected that generalizations can be made based on this study. The laundromats in terms of their architectural design and business models represent the laundromat environment that is typically experienced by washateria customers throughout Thailand. It may also be possible to generalize beyond Thailand as similar spaces, typologies, and business models exist throughout Asia and worldwide. The number of laundromats in Thailand reached over 4564 in 2022 The majority of them are located in Bangkok, This does not include all the small mom-and-pop operations with one or two washing machines.
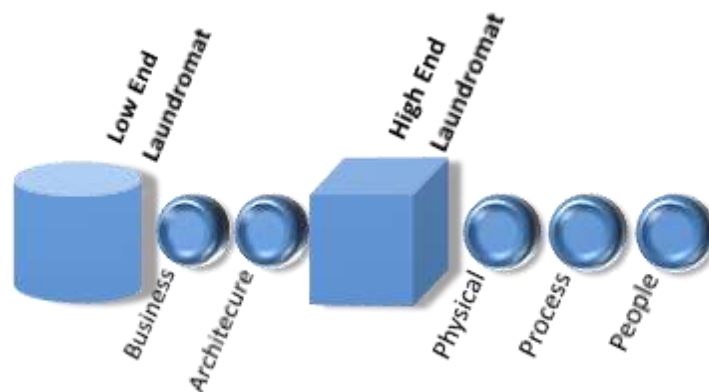

Fig. 3. Laundromat dimensions

3.2 Sample

The study focused on laundromats in Bangkok, Thailand. The study included coin-laundry spaces downtown and the suburbs of varying sizes and designs. The survey was conducted during regular working hours on weekdays and weekends including government holidays and religious holidays. The majority of laundries in Bangkok are open from morning to evening and most of them 24/7. The majority of the automated laundry spaces were exactly that fully automated with no permanent staff on site. The customer participants of the study were self-employed, as well as corporate employees and students ranging from high school to university age. Many elderly and housewives used the laundries and may have brought their young children. Tannenbaum C, Greaves L, Graham ID [24] pointed out why sex and gender matter in implementation research. The majority of the visitors were female (67%) who were under 30 years old with an undergraduate university education or at least a high school diploma. However, the age spanned from 11 to over 80 and included participants of various socioeconomic classes, religious, ethnic, and migration backgrounds. The sample size was 200 respondents, the sample was a random convenience sample that represented the demographics of the coin-laundry customer population in Bangkok, Thailand towards the end of the COVID-19 epidemic in the New Normal.

3.3 Analysis

We used SAS (Statistical Analysis System) for the statistical analysis of the data and calculated the mean and standard deviation (SD) as well as the Pearson Correlation Coefficient. In statistics, the correlation coefficient r measures the strength and direction of a linear relationship between two variables on a scatterplot. Where the value r = 1 means a perfect positive correlation and the value r =

-1 means a perfect negative correlation.
+0.30. A weak uphill (positive) linear relationship
+0.50. A moderate uphill (positive) linear relationship
+0.70. A strong uphill (positive) linear relationship
+ 1.00 A perfect uphill (positive) linear relationship

Requirements for Pearson's correlation coefficient are:

1. The scale of measurement should be interval or ratio.
2. Variables should be approximately normally distributed.
3. The association should be linear.
4. There should be no outliers in the data

Equation:

$$r = \frac{\sum_i (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_i (x_i - \bar{x})^2} \sqrt{\sum_i (y_i - \bar{y})^2}}$$

r = correlation coefficient
xi = values of the x-variable in a sample
x = mean of the values of the x-variable
yi = values of the y-variable in a sample
y = mean of the values of the y-variable

4. RESULTS AND DISCUSSION

According to Philip Kotler [25], the father of modern marketing, product, price, place, and promotion form the traditional (4P) marketing mix for products. This model was expanded for the marketing of services to include people, physical evidence, and processes [26]. The results of the study were grouped according to the variables in questions of the research hypothesis which focus on the 3P of the service marketing mix [27,28].

4.1 Process

We looked at the various processes of laundromats according to the sequence of steps involved in the coin-laundry experience. The first step is to find an available machine this is often considered luck if you find one based on the day and time. Available washing machines received a mean of 3.95 and an SD of 0.67 as strongly agreed upon by the respondents. This is an area of potential improvement for more upscale launderettes. Payment was the next parameter Cash is the traditional way in the coin-laundry establishment. In the USA customers use quarters in Thailand 10-baht coins or the machines accept bills like 20-baht and 100-baht bills. But more likely the individual machines may only accept tokens this way the cash is collected in one place that can be more easily hardened than each individual machine. This bill or token changer was traditionally the way to go. Payment methods received a mean of 3.32 and an SD of 0.98 and were agreed upon by the respondents. New forms of digital payments and cyber cash are also entering the industry in Bangkok. No

wonder cleanliness and hygiene were found highly important in the laundry business, especially during the COVID-19 pandemic, and received a mean of 3.91 and SD 0.66 and was strongly agreed upon. Cleanliness is the essence of the laundry business. Security received a mean of 3.33 and SD 0.97 and was agreed upon. To feel secure in the laundromat is very important in terms of personal security and theft of the items being laundered. Equally important is the condition of the washing machines and other equipment, if they malfunction or are in a dilapidated condition this will cause a lot of frustration with the customers who strongly agreed upon with a mean of 3.91 and an SD of 0.61. Drop-off services received a mean of 3.03 and an SD of 2.15 and were disagreed upon. There is not much interest in drop-off and delivery service especially at the lower end of the market. Dryers received a mean of 3.29 and SD of 0.96 and were only agreed upon as not everyone in Thailand uses a dryer. In the tropical heat, laundry dries very quickly while hanging on a laundry rack or washing line. Other services were mildly agreed upon with a mean of 3.15 and SD of 2.00. Customers are less interested in value-added services such as coffee shops or carwash. Overall the importance of the process parameters was agreed upon by the participants of the study and received a mean of 3.41 and an SD of 1.28.

The availability and wait time for washing machines have a correlation coefficient of 0.905 and were found to be very important for the participants of the study. Nobody wants to wait until a washing machine becomes available. The payment process had a lower correlation coefficient of 0.699 as users preferred places where it was easy to pay by cash and a money changer for bills and tokens was available. Participants were okay with using tokens as a payment form. Electronic payments are gaining in popularity, especially in the upscale facilities. Cleanliness was almost a straight line with a correlation coefficient of 0.907 very close to perfect. Users want clean machines and a clean laundry facility. Security and safety are also very with a correlation coefficient of 0.704. Crimes are a big concern when using a laundry facility, especially for female customers. The working conditions of the equipment and washing machines are very important, with a correlation coefficient of 0.877 close to a straight line. Creature comfort had different levels from tables and chairs to drop-off services received a low correlation coefficient of 0.303 as especially low-end coin-laundry customers cannot afford other people to take care of their laundry needs. Dryers had a correlation coefficient of 0.687 which reflects a strong but not very strong demand for dryers by Thai customers. Other services have an even lower correlation coefficient of 0.705 which was not very strong as most customers cannot even imagine what other services could be provided. Most often food and beverage services like coffee shop comes to mind along with various vending machines for drinking water etc. Overall the process component of the laundromat service marketing mix received on average a correlation coefficient of 0.723 which makes the process a strong uphill relationship [29,30].

Fig. 4. The laundry process

Table 1. Demographics laundromat study

Laundromat study demographics	Respondents (Count)	Percentage (%)
Gender		
Male	66	33%
Female	134	67%
TOTAL	200	100%
Age		
11-20 years	48	24%
21-30 years	62	31%
31-40 years	38	19%
41-50 years	12	6%
51-60 years	14	7%
61-70 years	20	10%
71-80 years	4	2%
>80 years	2	1%
Education		
Elementary school	12	6%
High school	42	21%
Vocational school	16	8%
Undergraduate degree	114	57%
Graduate degree	16	8%
Occupation		
Student	60	30%
Self-employed	30	15%
Employee	84	42%
Retiree	26	13%
Type of Housing		
Dormitory	20	10%
Hotel	4	2%
Room Rental	48	24%
Apartment	104	52%
Condo	12	6%
Townhouse	8	4%
Single-family Home	4	3%
Household Size		
1 person	50	25%
2 persons	96	48%
3 persons	30	15%
4 persons	14	7%
More than 4 persons	10	5%

Table 2. Process parameters

Process	Mean	S.D.	Results
Parameters			
1. Available Washing Machines	3.95	0.67	Strongly Agreed
2. Payment	3.32	0.98	Agreed
3. Cleanliness	3.91	0.66	Strongly Agreed
4. Security/Safety	3.33	0.97	Agreed
5. Equipment Condition	3.91	0.61	Strongly Agreed
6. Dropp off service	3.03	2.15	Disagreed
7. Dryers	3.29	0.96	Agreed
8. Other Services	3.15	2.00	Mildly Agreed
Average	3.49	1.26	Agreed

Table 3. Process correlation coefficient analysis

Process Parameters	Correlation Coefficient	Relationship
1. Available Washing Machines	0.905**	Very Strong
2. Payment	0.699**	Strong
3. Cleanliness	0.907**	Very Strong
4. Security/Safety	0.704**	Strong
5. Equipment Condition	0.877**	Very Strong
6. Dropp-off Service	0.303**	Weak
7. Dryers	0.687**	Strong
8. Other Services	0.705**	Strong
Average	0.723**	STRONG

4.2 Physical Evidence

Services are intangible in their very nature but their touchpoints provide an opportunity for physical evidence with which the customers can connect. Here we looked at the participant's satisfaction with the various architectural design aspects of the coin-laundromats according to the architectural philosophy of the German Bauhaus which is 'form follows function the importance of the overall architectural design (Mean 3.95, SD 0.75) was strongly agreed upon. While the façade and exterior design are important to attract customers to the facility with its curb appeal (Mean 3.42, SD 0.82) it was not very important to the customers, especially on the lower end of the facilities spectrum. Maybe because they are already so familiar with their neighborhood laundry that they automatically identify themselves with it. More important for the customers was the interior design which makes them feel comfortable and provides creature comfort with certain desired amenities (Mean 3.85, SD 0.75) which was strongly agreed upon. The overall atmosphere of the laundromat was very strongly agreed upon (Mean 3.96, SD 0.82) in all market segments of the automated laundry business from the low end to the top end. The atmosphere is a reflection of the location and the neighborhood the laundromat is in. Ample parking spaces for both cars, motorbikes, and bicycles are extremely important along with easy access to the main traffic arteries and means of public transportation such as Skytrain, MRT, and most importantly buses (Mean 3.82, SD 0.82) again this is for facilities which attract customers from outside the apartment building or the neighborhood. Food and beverages (F&B) should also be available most likely in the form of a coffee shop or an array of vending machines for cold and hot food and drinks as Thai people love to eat while they wait for the laundry to be done. (Mean 3.43, SD 0.73). Entertainment was only agreed upon with (Mean 3.37, SD 0.94).

About a decade ago public and cable TV watching while waiting was more popular, but also more controversial as different customers preferred different channels. Then came free Wi-Fi access but today most customers have their own Wi-Fi and use social media while waiting for the laundry to be done. Other services reaching from vending machines that provide detergents and other necessities related to doing laundry are demanded less frequently (Mean 3.16, SD 1.95) and were only mildly agreed upon as not all users of coin-laundry spaces use these types of services and they are not available in all laundromats. One-stop laundry services which also include messenger services like LalaMove, LineMan, Grab Bike, Skootar, Uber, or independent motorcycle couriers to deliver laundry and actually do the laundry for the customers are still in their infancy. And so are auxiliary services like carwashes, oil changes, and fitness studios along with pedicures and manicures, and massages. Overall the physical evidence components received an average of (Mean 3.65, SD 0.95) and were generally agreed upon to be very important for the laundromat experience. With increasing automation of the laundry business, the physical components start to take on the faces of the employees and force them more in the background [31,32].

The architectural design aspects of laundromats received a high correlation coefficient of 0.907 for both the overall architectural design aspects of the facilities. However, the exterior design and curb appeal had only a strong correlation coefficient of 0.666 as it appears that regular customers care less about the appeal than new drive-by customers who don't live near the laundry facility. The interior design and furnishing ranked higher with a very strong correlation coefficient of 0.897 as the creature comfort is very important for the participants. The overall atmosphere received the highest correlation coefficient with 0.911 even so the participants

had a hard time explaining what the meaning of atmosphere is. Parking and access to public transportation received the fourth-highest correlation coefficient of 0.842 often for neighborhood laundries in walking distance parking is less important. Food and beverage services were found less important, with a weak coefficient of 0.435 as there are usually plenty of other F&B providers nearby. Entertainment in the form of TV was less important with a low correlation coefficient of 0.423 Most important were outlets for charging personal entertainment devices such as mobile phones and tablets, also providing free Wi-Fi did not rank that high anymore as in the past. Other services to be offered at the laundromat for example carwash and massage received only a correlation coefficient of 0.351. Overall the physical evidence received an average correlation coefficient of 0.679 which represents a strong uphill relationship but the importance of physical evidence is also in a straight-line relationship with the spectrum from low-end to high-end laundry facilities.

4.3 People

Laundromats vary greatly in the number of employees involved in the daily operation. While new laundromats with video surveillance, remote monitored, and troubleshooting have little or no people onsite except for occasional cleaning, repairs, and employees or owners collecting the cash. The same holds true for the low-end with one coin-operated machine where someone comes by every night or every few days to collect the money. High-end laundromats are also high on service and customers expect someone to be there constantly to assist with instructions and take care of cleaning, maintenance, and security. The high-end expects security guards to remove undesired elements loitering in the laundry facility. In Thailand, asking people to leave the premises is sometimes a difficult task. Security guards don't like to scare street children and poor elderly away. Street dogs and cats prefer to stay in the coin laundry as it has a fan or even air-conditioning. Very high scores for the people component as people make the difference. Friendly service-minded employees in person, on the phone, or in a video call via Line or Skype (Mean 3.92, SD 0.56) were strongly agreed upon. The efficiency of the staff and their ability to solve problems either on-site or remotely (Mean 3.33, SD 0.63) was also agreed upon. The owner/manager played an important role in the minds of the participants with a Mean of 3.87

and an SD of 0.67 which was strongly agreed upon. In a self-service laundry, the customers usually deal directly with management in case of a problem. The customer mix was the most important for the participant and strongly agreed upon with a Mean of 3.87 and SD of 0.88. The gender of the customers was not a serious consideration for respondents with a Mean of 3.21 and an SD of 1.01. The customer occupation like housewife or student was a more important people component with a Mean of 3.32 and an SD of 0.64. The customers' social status received a Mean of 3.43 and an SD of 0.65. The importance of the neighborhood with a Mean of 3.91 and an SD of 0.52 was strongly agreed upon as laundromats are neighborhood businesses. On average the people perspective received a Mean of 3.59 and an SD of 0.69 and considered an important component of the laundromat mix.

Staff friendliness and service-mindedness in person or on social media received a very high correlation coefficient of 0.802 and formed a very strong relationship. People like to see a smiley face. Lower ranked was staff efficiency and their ability to solve problems with a coefficient of 0.704 and a strong relationship. There is very little staff in the laundromat except high-end laundromats which have a stronger human component. The effectiveness of the owner/manager ranked higher with a coefficient of 0.820 a very strong relationship. As the laundry business is the ideal SME customers deal in most cases directly with the owner. The customer mix was the most important for participants with a coefficient of 0.907. Most interaction happens with fellow customers who make the laundry a pleasant experience while chitchatting. Customer gender was not important with a coefficient of 0.470 in other words a non-issue. The occupation of the customers ranging from students to retirees of the coin laundry received a higher coefficient of 0.566 and formed a strong relationship. The customers' social status received a coefficient of 0.698 which indicated a strong relationship as a laundromat usually mirrors the population of the neighborhood. This brings us to the next parameter neighborhood or neighbors, which was a very strong relationship with a correlation coefficient of 0.910. An almost perfect uphill (positive) linear relationship. Overall the people component of the laundromat averaged with a correlation coefficient of 0.735 which represents a strong positive uphill linear relationship

Table 4. Physical evidence parameters

Physical evidence Parameters	Mean	S.D.	Results
1. Architectural Design	3.95	0.75	Strongly Agreed
2. Exterior Design/Curb Appeal	3.42	0.84	Agreed
3. Interior Design/Furniture	3.85	0.75	Strongly Agreed
4. Atmosphere	3.96	0.82	Strongly Agreed
5. Parking/Public Transportation Access	3.86	0.82	Strongly Agreed
6. Food and Beverages	3.43	0.73	Agreed
7. Entertainment/TV/Wi-Fi/outlets/chargers	3.37	0.94	Agreed
8. Other Services (carwash, massage, etc.)	3.16	1.95	Mildly Agreed
Average	3.65	0.95	Agreed

Table 5. Physical evidence correlation coefficient analysis

Physical evidence parameters	Correlation coefficient	Relationship
1. Architectural Design	0.907**	Very Strong
2. Exterior Design/Curb Appeal	0.666**	Strong
3. Interior Design/Furniture	0.897**	Very Strong
4. Atmosphere	0.911**	Very Strong
5. Parking/Public Transportation Access	0.842**	Very Strong
6. Food and Beverages	0.435**	Weak
7. Entertainment/TV/Wi-Fi/outlets/chargers	0.423**	Weak
8. Other Services (Carwash, Massage, etc.…)	0.351**	Weak
Average	0.679**	Strong

Fig. 5. Physical evidence

Fig. 6. People evidence

Table 6. People perspective

People Parameters	Mean	S.D.	Results
1. Staff friendly/service mind	3.92	0.56	Strongly Agreed
2. Staff efficient/fast/problem solver	3.33	0.63	Agreed
3. Owner/Manager effective/creative	3.66	0.67	Strongly Agreed
4. Customer Mix	3.87	0.88	Strongly Agreed
5. Customer Gender	3.21	1.01	Agreed
6. Customer Occupation	3.32	0.64	Agreed
7. Customer Social Status	3.43	0.65	Agreed
8. Neighborhood	3.91	0.52	Strongly Agreed
Average	3.59	0.69	Strongly Agreed

Table 7. People correlation coefficient analysis

People parameters	Correlation coefficient	Relationship
1. Staff friendly/service mind	0.802**	Very Strong
2. Staff efficient/fast/problem solver	0.704**	Strong
3. Owner/Manager effective/creative	0.820**	Very Strong
4. Customer Mix	0.907**	Very Strong
5. Customer Gender	0.470**	Moderate
6. Customer Occupation	0.566**	Strong
7. Customer Social Status	0.698**	Strong
8. Neighborhood	0.910**	Very Strong
Average	0.735**	Strong
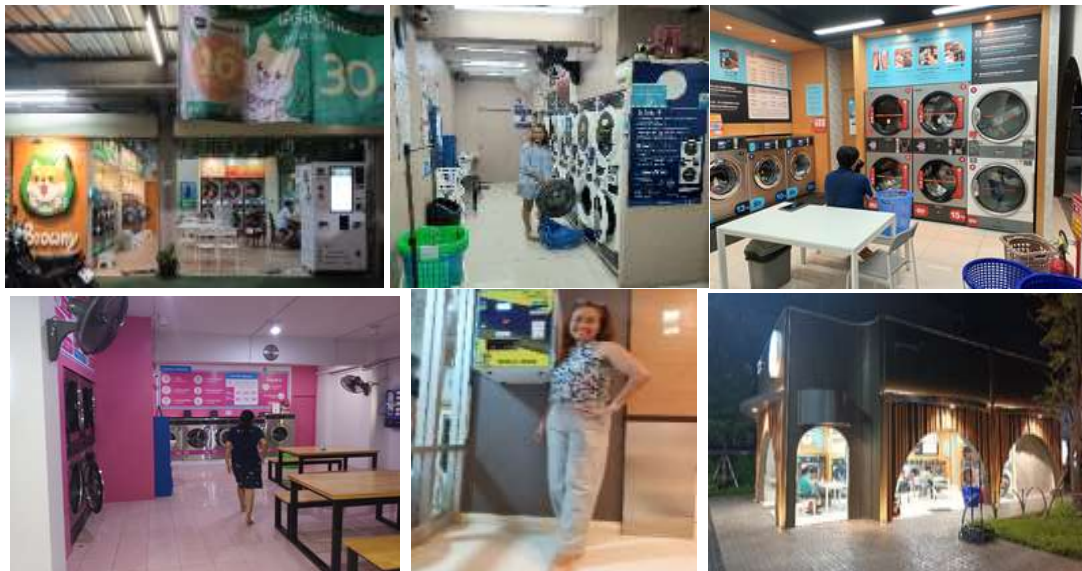
Fig. 7. People = customers + staff (in-person/online)

5. CONCLUSION

Laundromats were on the rise in Thailand before the COVID-19 pandemic but one can say that the health issues surrounding the coronavirus virus which was spread from Wuhan China around the world gave the Thai washeteria industry the biggest boost. Before there were individual coin-washers located in and in front of apartment buildings. Many people turned to affordable laundromat options during challenging economic times while worrying about the health and safety of their families. Vended laundry provides a convenient option for individuals who do not have access to laundry machines at home or those who need to clean larger items that may not fit in

a standard household washing machine. Typically, a laundromat is equipped with multiple washing machines and dryers of various sizes to accommodate different loads and types of fabrics. The machines may be top loaders or front loaders, while front-loaders are more expensive they are easier to stack but more difficult to interrupt the washing cycle. Even those more affluent families with domestic appliances use large-capacity machines for bulky items. This customer segment also looks for TLC, the quality of the service, and results. The most important factor when starting a laundry business is location, location, location. In Thailand, coffee shops are very popular and laundromats start to be next to coffee shops or even be together with coffee shops. A new development is also to have laundromats in 7-Eleven convenience shops the idea is to provide one-stop shopping and also to entice customers to shop while waiting for their laundry. Another option of bundling is to have laundromats next to car-washes, oil-change, or beauty salons and massages. Fitness centers may offer another opportunity to kill time while doing laundry. It is predicted by the author that this will be an increasing trend especially in shopping centers and close to shopping areas while these are expensive lease areas this may fit the mold for upscale laundromat shoppers who prefer the quality of the service that they perceive as cleaner even as doing their laundry at home and the next step is a commercial laundry with drop-off service for expert wet cleaning or dry-cleaning service and large and complicated items such as bedcovers, curtains, carpets and heavy winter coats especially fur and leather coats along with the opportunity for cleaning handbags. Many high-end customers feel dry-cleaning is to be avoided at all costs, and the same results can be reached by gently washing. The rise in environmentally conscious people who seek to lessen their carbon footprint by reducing the usage of household electronics such as washers and dryers is expected to drive the global laundromat market. Having automated laundry in fitness studios where you can ride stationary bicycles to generate electricity for your laundry may be the ultimate in reducing the carbon footprint. The impact on the Thai market will be less and upscale laundromats gamble by investing in this high-end market. The author hypothesizes that there will be a short-term increase in vended laundromats but the commercial pick-up and delivery services will be the choice of the upper class. Another opportunity is having motorcycle taxis deliver the

laundry start the laundry process and pick it up when finished. Customers can also take advantage of wash-dry-fold services. When customers bring their laundry in (drop-off/pickup) it will be done within a 60-minute turnaround. They can also have their laundry picked up and delivered back home within a 24-hour turnaround. Finally, customers can start the washing machine(s) and then have store staff handle the rest with their dry-and-fold service. Dry cleaning services are also offered. Safety is ensured with a robust video surveillance system. Toilet facilities are important often smaller launderettes have no toilet, only a sink. A great opportunity to kill time would be to do a workout in a fitness center adjacent to the laundry. Often this starts with a scale that shows you your weight.

While there are many commonalities in the laundry business the Thai market has its special twists. Coin-laundry machines existed for decades serving the lower-income population who could not afford a washing machine and their alternative washing by hand. These washers charged between 30 to 40 baht a load ca US$ 1 and provided only cold water. These machines can be purchased for around US$200 depending on the manufacturer (LG, Samsung, Electrolux) and size from 8 to 13 KG. The laundromat market in Thailand has great growth potential. Initially in Bangkok then in tourist areas like Pattaya, Phuket, and Chiangmai with a high density of foreigners living there. Other Thai towns will follow with a mix of laundromats in various categories. From low-end washing machines-only shops to laundromats with coffee shops on the high end. Laundromats in combination with car-washes are often seen as a natural integration. In Thailand, massages are a welcome way to kill time while waiting for the machines to do the work. The franchised and upper-end businesses have major laundry machine manufacturers behind them like Maytag and may partner with convenience store chains like CPALL 7-Eleven to place washing machines there and oil companies like PTT with laundromats in gas station strip shopping centers where you can charge your electric car while doing laundry and enjoy a cup of coffee at Amazon or eat fried chicken at Texas Chicken. This will be a mixture of event dining, life entertainment, and laundry. The main target audience remains females in Thailand while in other countries single males are the predominant users of self-service laundries. One also has to remember that self-service laundries are exactly
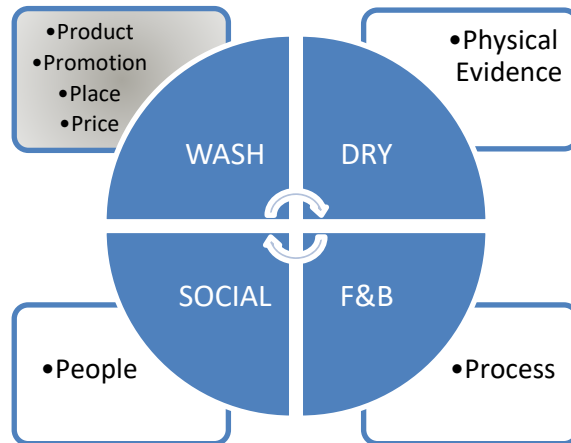
Fig. 8. Laundromat service mix model expanded

L Process

Services
Self-service
Pick-up and delivery
Washing, drying,
ironing,

Opening Times
early
late
24/7

**Laundromats
Physical Evidence**

Equipment
washers
dryer
Size: 8,10,13,16 kg

Payment Forms
Cash/token
Credit card
Electronic/app

L People

Staff
Owner/manager
Maid/security/cashier
On-site/remote/virtual

Ownership
Proprietor
Partnership
Corporate/Franchise

L Product
Washing/Drying
Detergents/Softener
Food & Beverages
Add-on

L Price
20/40/60 baht
Per kg/minutes
Low cost
High profit

L Place
Freestanding
Multifamily housing
Low/high-income
neighbourhood

L Promotion
Off-peak discount
membership
bundling

Fig. 9. Laundromat 7P of marketing

that self-service and therefore the people component is less and automation plays an even greater part in automated laundries with laundry apps, electronic payment systems, motion

sensors, and security systems, remote monitoring of washers and dryers' operation as well as interactive two-way video and audio cameras that help a customer service center to remotely support operations across Thailand.

Even so, the popularity of laundromats may vary depending on cultural norms, lifestyle patterns, and economic factors in different countries. Some low-income people use laundromats regularly as their primary means of doing laundry, while others more affluent may only use them in special circumstances, such as when traveling or when their home appliances are out of service or there are some special cleaning needs. The demographics of home and machine ownership mean that the majority of laundromat users are in poorer communities, and this is where businesses often cluster. Low incomes also mean that customers have limited funds and that laundromats can't pass on the rising costs of utilities to their customers. Together with competition, both within the sector and from home machine sales, this is putting the financial squeeze on laundromats once the market matures in Thailand. A big issue in laundromats is the availability of machines and the wait for doing laundry so an app that helps to reserve and book machines would be a great opportunity. The first step is to see if a washing machine is available. Currently, there is no app or video feed that can show you available machines. This will be a great opportunity for product differentiation. The new forms of payment system may also include digital payment along with club membership and monthly billing this may only be for upscale laundromats.

5. RECOMMENDATIONS

It is highly recommended to follow up this study over time in the New Normal of COVID-19 after 2022. We may also expand the scope of the study and focus on different aspects of the same self-service laundries in Thailand. We would also like to recommend a larger sample with more respondents and more coin-operated laundries in Thailand. We could also focus on other customer segments such as foreign visitors and expatriates as well as guest workers from Cambodia and Laos. It would be interesting to apply the same instrument to other laundromats outside of Thailand in neighboring ASEAN countries like Cambodia, Laos, and Myanmar as well as Malaysia and Vietnam to have a comparison.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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