



# Facility Management in Private Finance Initiative Project in UTHM Pagoh Campus

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**Abstract:** Facility management (FM) in Private Finance Initiative (PFI) involved a long-time process and duration in improving the infrastructure and associating the facilities. FM will give a support role or service within an organisation that have been strategically integrated approach to operating, maintaining, improving, and adapting the buildings and supporting services in order to create natural environment. In a long-term relationship, facility management need to evolve to a higher strategic level in compliance with the organisation's strategy. At the end of the process, it will achieve best value and performance on delivery of support services. In this research, direct observation has been done to analyze facility management provided in UTHM Pagoh Campus. Furthermore, the satisfaction level of building occupants also was investigated by using different measurement factors in a structured questionnaire to measure the effectiveness. Hence, the results concluded that the total overall satisfaction of users towards facility provided by private sector are mostly satisfied among building occupants. From the results obtained, outdoor area was ranked first out of eight measurement factors. An interview has been done in order to clarify the success of facility management. It can be summarized that all the facility supplied by private sector were meets Key Performance Indicators (KPIs), by meant it also need to improvise their services provision.

**Keywords:** Facility management, private finance initiative, campus

## 1. Introduction

In recent years, there has been a dramatic growth in Private Finance Initiative (PFI) worldwide. Currently, Malaysia is still in developing phase by creating its own version of PFI projects, which it might turn away from the basic principle. It should be considered from political and economic aspects of the country. PFI project is best suited for education, hospitals, transportation, government building, etc. As PFI deliver services, Facility management (FM) take full responsibility as a leader in every task including design, planning, construct, operation, and maintenance to prevent failure of building performance and penalty to the service provider, (Nutt B, 1999). To deliver effective services provision, skills and knowledge are compulsory from technical aspects, relationship management, knowledge of business, communication approach and ability to focus on high level outcomes. Therefore, the responsible team should make a strategic decision to face any issues and challenges in future. It is essential for the education buildings to be constructed efficiently to serve its occupants and at the same time make it as a worth investment to the community. Currently, tons of emphases are being placed in the creation of high-performance buildings to ensure its safety, healthy, energy efficient and towards natural environment. Good construction practices will lead the buildings to meet high performance goals and standard. A comfortable learning environment is compulsory by providing goods and high quality of facilities and services. This will

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ensure better performance afterwards and make the facility more long-suffering through the contracts period. Previously, (General Accounting Office, 1996) has proof that the delivery of facilities management services for PFI in United Kingdom (UK) schools was in satisfactory levels. Most of the schools gave positive feedback from the users compared to their former schools.

Countless types of projects have been procured through Private Finance Initiative (PFI) in Malaysia. The success or failure of a project is depending on how the key players are integrating in delivering PFI project effectively. In Malaysia, there are certain issues that got the ministers concern in implementing PFI. It is proven in 'PFI: Meeting the investment challenge' report, this type of projects only suitable for certain major capital projects, and at the same time it will be less advantages for small capital projects. Hence, it can be concluded that the key issues of PFI in Malaysia is the financing aspect.

In 2014, UTHM Pagoh Campus was built based on PFI contract made with Sime Darby Properties Sdn. Bhd., hence, this study aims to assess and analyze the perception from occupants' views with the effectiveness of the facility management based on the successfulness of services delivery. From the data obtained, it will clarify the facility management provided from PFI project.

## **2. Literature Review**

### **2.1 Private Finance Initiative (PFI)**

The PFI has become one of the Government's main instruments on delivery public services. It started to rise in many states especially Western construction economies and Channel Tunnel was the first financed projects built in 1987 (National Audit Office, 2003). The selection of procurement strategy in UK has been used to build infrastructure services such as roads, airports, buildings, health, and others. For instance, in France, private financing for highway was initiated in late 1960s until early 1970s. Like Spain and Italy, they also take an encouragement to use the same procurement method in the early 1970s (National Audit Office, 2003).

The principle of PFI is that a public sector bodies acquires services more than the asset. A private sector contractor funds any required asset and afterward they paid for the service provided. In simpler terms, public sector is rent the facility at first rather than owns the asset. Public-Private Partnerships (PPP) is a general term for the interconnection between public and private sector for the benefit of both parties, which have gained wide interest of working arrangements from loose, informal, and strategic partnerships around the world. This type of service contracts is clearly more inclusive in concept than PFI.

In Malaysia, PFI was officially implemented through the Ninth-Malaysia Plan (9MP) by Malaysian Government under the National Privatization Plan. Previously, Malaysian's fifth Prime Minister outline that implementation of private sector's program has successfully achieved a great participation along with the contribution of government sector. Both sectors have strongly created inordinate cooperation where it leads to a higher level from economic aspect. Despite that, it required some of the changes which include focusing on PFI projects based on national development concerns. These also give plenty of benefit towards private sector where it can enlarge their opportunities in construction industry. Back then, many countries around the world such as Japan, Italy, Australia, France, Germany, and USA have successfully implemented PFI projects more than a decade and being the world leaders. Nonetheless, the structures of PFI are quite different from each country (National Audit Office, 2003).

### **2.2 Facility Management**

According to (Nutt B, 1999), FM comprise wide field of activities, for instance workplace, facility, support services, property, corporate real estate, and infrastructure. They are also responsible in delivery those type of services and operates over an agreed time span to meet stakeholder's standard performance. FM is known as an organization-specific function which based on real business need, even though it can operate in different situations (Hinks J, Kelly J & McDougall G, 1999). Furthermore, FM also can work in a different scenario due to project's scope and responsibility by applying different methods which might concern the facility manager. In project life cycle, FM takes role in bid, design, built, finance and operate facilities apparently in all stage (Nutt B & McLennan P, 2000). Then, he also stated that PFI projects give a huge impact to the project in operation and maintenance works because of long term agreement.

### **2.3 Facility Management (FM) in Private Finance Initiative (PFI)**

Chotipanich (2004) has stated that facilities management (FM) is the main key in a construction business by managing buildings and infrastructure, support services and working environment. In PFI, FM has a huge role in planning, designing, and managing facilities including equipment and systems. Its purpose was to determine their capability without compromising their own performance set by client or stakeholders. The successful delivery of services is based on several factors and issues. To determine the success of delivered PFI projects, there are benchmark are seen as being:

- i. Optimum risk transfer from cost and quality aspect
- ii. Suitability with its purpose

- iii. Validity of cost from service and refresh costs aspect
- iv. Innovation
- v. Value for money (VFM)

From above criteria, the other way to measure the success and optimum performance of PFI is on how it returns to the investor based on the capital investment. Throughout the competition process, the positive result is depending on the design solution, thus it makes the input of FM skills are essential. Design phase is the crucial part which designer need to form an effective product to create the suitability with its purpose and standards required to service levels in whole life terms. Plus, the product must have characteristics of maximize operational performance by minimizing the disturbance to the 'end user' client, which meant, it can be used in a long time over the years. Hence, the involvement of FM consultation must notify all clients to guarantee the expectations of stakeholder can be delivered. For example, during procurement process, FM experts have limited participation which related to PFI schemes and led to unsuitable decisions in education sector. FM supplier will take responsibility to deliver the products which followed by the standards of service specifications. From that, FM gains lots of advantage from PFI projects.

To achieve a successful result, FM experts in technical advice department are required to cover macro and micro issues regarding in outlining the case to bear the needs. It includes all change and design, construction and operational problems that might demand negotiating with PFI party. Their involvement will give a huge benefit towards client organisations whereby the public sector's framework will complement the premises investment against service plan. Consequently, FM practitioner will lead the role in managing and maintaining on behalf of PFI party or public sector. Throughout the PFI process, other stakeholders such as accountants, lawyers and bankers also contribute a lot and give significant influence.

## 2.4 Facility Management in Campus

University is one of the institutions that delivers knowledge to the mass and major function in teaching, research, and community services (Global University Network for Innovation (GUNI), 2009.) According to General Accounting Office (General Accounting Office, 1996), three from four of existing United State (US) schools was built before 1970. From these statistics, one-third of the schools needed to do some repair and replacement work and the remaining had inadequate building characteristic, for instance roofing, electrical systems, or plumbing problem. From that, a statistic shown that 58% had unsatisfactory related to environmental condition in their schools. Generally, the quality of facility acts as an important parameter for both of teacher and student learning. At the same time, their physical and emotional health are also depending on the same factor as it can enhance a good and healthy buildings essential.

### 2.4.1 Laboratory Facilities

It is commonly known laboratory are equipped with ventilation systems, environmental controls, fume hood and other exhaust devices associated with such equipment. Types of experimental work and laboratory facilities need to be synchronized safety and efficiency in future (The National Academics of Sciences, Engineering & Medicine, 1995). Thus, the comfortability of occupants in the laboratory space are significant regarding the type of facilities provided to avoid any problems ahead in the future. It depends on the design of space which followed by standards and regulations in combining features of traditional laboratories and classrooms. A past study on the availability and quality of laboratory facilities might influence the availability and quality of effective teachers. The results show that parents requested improvements and won \$5 million which included new science laboratories (Henderson A T & Mapp K L, 2002). Hence, the facility should be equipped completely with all types of systems suited with its function.

### 2.4.2 Teaching Facilities

Past researchers had consistently found out that school facilities give a big impact on teaching and learning in profound ways over the past century (Center for Evaluation and Education Policy Analysis, Penn State, 2015). Teaching facilities includes an area for an instructor or teachers to teach a plurality of classes. Other than that, it also provides a communication device with at least one computer teaching board. The idea of teaching facilities has completely undergone a changed with the growth of computer-based instruction, video projection and telecommunication requirements (US Legal). But students needed proper guidance on how to use and what is the real function of the new learning materials (Wrag E C, 2004). Surrounding of teaching area also contribute a lot in making the learning process run smoothly. The location of teaching facilities and room itself in somewhere place also matters since it can disturb and caused some issues on sound produced such as by vehicles, machines, and conversations between people.

### **2.4.3 Workspace Facilities**

Workspace is meant by a space need by people in supporting their works and responsibility by considering the years ahead too. In 1990s, many workplaces had designed in an old method of approaches and failed to consider everyone's needs and business (Boyett J, 1996). This is due to weak organizations and less tolerate of work environments that are unsupportive of their work attempt. The main objective of workspace management is to fit the requirements of tasks to perform effectively as time-space relationship can be achieved. The delivery of facility services, customization of workplace settings and adaptation of workplace layouts should have been accomplished from long ago

### **2.4.4 Facility Maintenance**

Building maintenance is required to match the performance requirements of building occupants perfectly, thus maintenance engineer must consider occupant's needs regarding environmental conditions, data communications and electrical power. Designer has a big role in providing enough access to plant and equipment, such as working space within ducts and plant room. The life expectancy of building should be taking note as the responsible party will find solutions within the maintenance schedule by providing high quality of service in short time. The main issues of maintenance are that it will disrupt office staff to do services and work, hence the steps to overcome this matter is doing during outside normal office hours (Thompson, 1994).

### **2.4.5 Campus Accessibility & Movement**

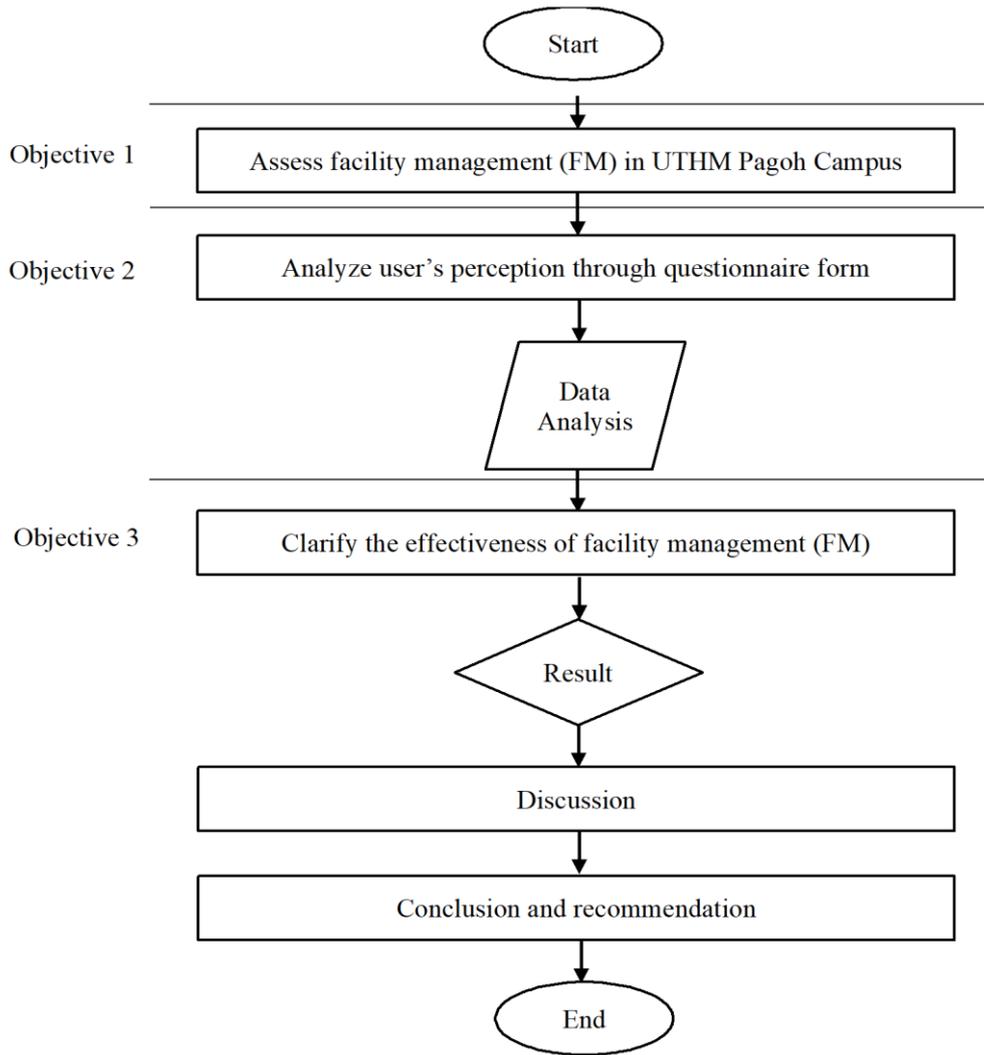
Buildings and roads are one of the compulsory infrastructures for the campus users to ensure their safety, security, and welfare. Campus accessibility is meant by connecting and organizing every fragmented open space or buildings, which facilitates the movement of people around the campus area in a natural setting. As people move in and around the campus, their safety is also important, for example by applying a walkway and security guards so that they will feel safe surround the area.

### **2.4.5 Outdoor Facilities**

Facilities provided at outdoor area should considered the suitability and possibility with the buildings. The environmental problems need to give thought to from the weather and climate and type of seasons in country aspect. The design and implementation of all landscape elements need to improve and maintained to keep the living things are not affected by surrounding area and achieve environmentally good campus.

## **3. Methodology**

The research tools used in this study are direct observation, structured questionnaire, and interview session. Direct observation was conducted as a qualitative method to assess the effectiveness of facility management in the campus. From that, questionnaire form was used to know user's views from their own perspectives and observation.



**Fig. 1 - Overview of methodology process**

The structured questionnaire comprised two parts, Part A and Part B which consisted of three different section. This study was based on the research instrument developed by Sullivan, which exhibited high reliability and validity based on the results of Cronbach’s Alpha value 0.94. The first part comprised user’s demographic information such as gender, age range, occupation, departments and working experience in the institution. All the three-section comprised total of 35 items regarding user’s satisfaction level on the facility in UTHM Pagoh Campus by using measurement factors as shown in table 1 below.

**Table 1 - Measurement factors used in the questionnaire**

Section 1	Section 2	Section 3
Teaching facilities	Workspace facilities	Total satisfaction
Laboratory facilities	General purpose facilities	
	Facility maintenance	
	Campus accessibility & movement	
	Outdoor area	

The level was measured by applying a 5-point Likert scale, which scale 1 referred as very unsatisfied while 5 referred as very satisfied, and the data collected were analysed using Statistical Package for Social Sciences (SPSS) version 22. Then, the collected data is ranked by using equation (1) of relative index as shown below. To achieve for the third objective, an interview session is made with Mr. Ahmad Zulfaris, facility manager of UTHM Pagoh Campus. The questions asked were about the effectiveness of facility management in the campus. At the end of the interview, the clarification and summary were made based on all of the discussions.

$$\text{Relative index} = \frac{1(n_1)+2(n_2)+3(n_3)+4(n_4)+5(n_5)}{5(n_1+n_2+n_3+n_4+n_5)} \quad (1)$$

### 3.1 Sampling and Data Collection

The data were collected by means of approaching method distributed to staffs and lecturers (N=169) which yielded 76 responses, which means the remaining 93 are not returned. Sekaran & Bougie (2010) has stated that the response rate of questionnaire should be achieve 30% from the total of the respondents. Hence, the data collected is valid since it got approximately 45% from 169 of sample size.

## 4. Results and Discussion

### 4.1 Facility Management in UTHM Pagoh Campus

The method used to attain the first objective is from the collection of literature review and direct observation. Literature review used were from the previous studies and researchers mostly from other countries which they researched on the facility management provided in institutions and the after-effect by using PFI project. From direct observation, all the facilities including classroom, lecturer room, cafeteria, laboratory, walkways, and others are meet the standards and requirements by UTHM party. Take for an example, there were so many parking lots nearby the main blocks, such as the function of block A1 are practically for the lecturers and all administrative staffs, hence, a lot of parking spaces were made in front of the block. Although there are certain parts that are still lacks from quantity and quality aspect, but Sime Darby are on making their efforts to ensure all campus users can used it in safe and secure way until the end period of PFI project. From non-fully requirements, along the walkway surround the UTHM Pagoh Campus, there were no roof covered for the student’s protection if bad weather happens.

### 4.2 User’s Perception on Facility Management in UTHM Pagoh Campus

For this study, the data collected shows that the female respondents are much greater than male from the total number of complete questionnaires received. Then, majority of both staffs and lecturers are in 25 to 39 years group range. There was also 1.3% from the data received is below 25 years old. Since the questionnaire were distributed according to their department, most of them are lecturers that came from Faculty of Engineering Technology and the second highest was Centre for Diploma Studies followed by Faculty of Applied Science & Technology. Only 30.3% respondents are staffs which came from administration office, safety management and laboratory management. After that, there were 2.6% of respondents who just started their works in UTHM. Other than that, 22 respondents already have 6 to 10 years of working experience in the institution.

The calculation of statistic descriptive method is used to calculate the data collected. First section consists of laboratory and teaching facilities factors that required lecturers and laboratory staff to fill only. This is because only these groups that have experienced to work in those area. Table 2 below shows overall results of Section 1 from user’s perception.

**Table 2 - Data analysis for Section 1.**

<b>Factors</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>A. Laboratory Facilities</b>		
Suitability of building with its condition	4.05	0.851
General appearance and comfortability	4.10	0.777
Cleanliness	4.14	0.759
Easily distracted by noise produced from vehicles, machine, and conversation between people	2.87	1.008
Inappropriate ventilation system	2.87	0.975
<b>B. Teaching Facilities</b>		
Suitability of building with its condition	3.97	0.861
General appearance and comfortability	4.03	0.950
Cleanliness	4.27	0.723
Easily distracted by noise produced from vehicles, machine and conversation between people	3.16	0.987
Inappropriate ventilation system	3.17	0.925

From table 2, cleanliness in laboratory area has the highest satisfaction (mean 4.14), while the lowest is the noise produced from outside and the inappropriate ventilation system. It can relate to location and functions of laboratory since different type of laboratory located on a different area. For engineering laboratory, it involved in the using of machines, hence the ventilation in the room is quite low. Plus, for the laboratory that using chemical substances it might cause danger and harmful to occupants, so it needs a proper ventilation systems and acoustics compared to engineering laboratory.

Throughout the data analysis of Section 2 in table 3, both staffs and lecturers had crucial problems on acoustics and indoor air system produced in their workspace area, proof by the mean data 3.14 and 3.37 respectively. Same as general purpose facilities such as toilets, cafeteria and others are on the same level which it might causes from insufficient amount provided and less quality used in those area. Other than that, less of public transport surround the campus area might be the cause of low mean data, 2.29. Compared to the safety of occupants in the campus, it shows the highest mean due to tight control from safety guards and policemen. Outdoor areas including the cleanliness area and intensive care of lawns and plants were at same range of mean.

**Table 3 - Data analysis for Section 2.**

<b>Factors</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>A. Workspace Facilities</b>		
Suitability of building with its condition	4.22	0.759
General appearance and comfortability	4.21	0.680
Cleanliness	4.33	0.700
Easily distracted by noise produced from vehicles, machine and conversation between people	3.14	0.962
Inappropriate ventilation system	3.37	1.031
<b>B. General Purpose Facilities</b>		
General appearance and comfortability	4.11	0.759
Cleanliness	4.24	0.728
Easily distracted by noise produced from vehicles, machine and conversation between people	3.45	0.855
Inappropriate ventilation system	3.36	1.016
Condition and cleanliness	4.03	0.748
Notifying about changes and renovations	3.39	0.834
<b>C. Facility Maintenance</b>		
Staff's accessibility	4.05	0.764
Quality of service provided	4.01	0.841
Notifying about changes and renovations	3.45	0.773
Time taken for the faults to be fixed	3.37	0.892
Always find solutions to problem in hand	3.58	0.837
<b>D. Campus Accessibility &amp; Movement</b>		
Easy to move and access the facility	3.84	0.767
Public transport	2.29	0.907
Location and number of the cycle ways and walkways	3.46	0.886
Maintenance of the cycle ways and walkways	3.20	1.046
Arrangements of car parking	3.61	0.910
Safe campus area	4.38	0.673
<b>E. Outdoor Area</b>		
Cleanliness	4.05	0.671
Intensive care of lawns and plants	4.03	0.673

In comparison with earlier described factors, it can be shown as in table 4, both of staffs and lecturers’ perception on total overall satisfaction are satisfied level with mean of 3.87, which means all facilities that have been delivered by Sime Darby are totally satisfy and meets user’s requirements.

**Table 4 - Data analysis for Section 3.**

<b>Factors</b>	<b>Mean</b>	<b>Standard Deviation</b>
<i>A. Total satisfaction</i>		
Overall satisfaction with the facilities provided in campus	3.87	0.822

Based on Table 5, outdoor area ranked first with higher relative index of 0.8079. It can be proof from the direct observation, the cleanliness in the campus area is quite good since the workers have a proper schedule to maintain and keep the area clean. The planted trees and lawns also being taken care of with intensive and not disturbing people and roads. Campus accessibility and movement factor is at the bottom rank due to low facility and services provided from public transport and the location and maintenance of walkways and cycle ways.

**Table 5 - Rank of factor based on calculation of relative index.**

<b>Measurement factors</b>	<b>Relative index</b>	<b>Rank</b>
Laboratory facilities	0.7213	7
Teaching facilities	0.7441	5
Workspace facilities	0.7710	3
General purpose facilities	0.7522	4
Facility maintenance	0.7384	6
Campus accessibility & movement	0.6926	8
Outdoor area	0.8079	1

### 4.3 Clarification on Facility Management in UTHM Pagoh Campus

To know either the findings from the first and second objective is valid or not, an interview with facility manager of UTHM Pagoh Campus, Mr. Ahmad Zulfaris has been done. The 30-minutes of interview was talked about the PFI in Malaysia and implementation in educational buildings. It also discussed about how far the other party has successfully delivered the facilities. He answered that, throughout the four years of period, the facilities management from them was started in an unsatisfactory level. For instance, they used low quality types of door and it need a repeated replacement, nevertheless they have improved slowly over the years by using high quality of materials. At the end, he summarized the clarification of facility management in terms of PFI is 70% success and he hoped for another improvement throughout the remaining period of concession between them.

## 5. Conclusions

In a conclusion, facility management in UTHM Pagoh Campus are still in developing process, whereby the facilities supplied by private sector, Sime Darby are in the phase of success. The main factors on how it builds, maintain, and operate as stated in PFI contract will become a major strategy for improving competitiveness in an educational institution. Even though there might be a slight dissatisfied scale on few factors, it might be due to the suitability of facility with the buildings, types of quality and amount of assets provided. This study has reviewed the satisfaction level of building occupants in UTHM Pagoh Campus by identifying the effectiveness of facility management provided.

This study will give benefit in management of facility in PFI, both of government and private sector and some findings will contribute to the growing field in facility management domain. In the future, it is recommended for future researchers to measure and analyze the service quality of a higher educational institute towards student’s satisfaction.

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