

# THE PROPERTY MANAGER

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**STRATA MANAGEMENT**

Defect Management of  
Stratified Buildings in  
Malaysia

**FEATURE**

Predictive Analytics  
for Successful Retail  
Stores

**KNOWLEDGE CORNER**

Digital Twin: What Is It and  
How Does It Work?

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Level 18-01-02, PJX-HM Shah Tower, No. 16A, Persiaran Barat, 46050 Petaling Jaya, Selangor  
Tel: +(603) 7493 1049 Fax: +(603) 7493 1047 Email: info@dimensionpublishing.com

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# Welcome to the 4th Quarter 2021 issue of *The Property Manager*!

To round up 2021, the articles in this fourth quarterly issue cover several different topics from defect management in strata buildings, predictive analytics, digital twins to information on claiming vacancy allowances for sewerage charges and vacant premises in Federal Territory of Kuala Lumpur.

The article on Defect Management by author Viola et al discuss the issues related to the defect management of stratified residential buildings in Malaysia from the perspective of building parcel owners and property managers.

Traditionally computerised models such as analog model, gravity models and regression models are used in assessing new retail store locations. More advanced analytics are now available in evaluating the trading potential of retail stores in particular predictive analytics. There are two articles on predictive analytics. The first explained what is predictive analytics and the second explained its application in a retail store context.

A digital twin is a digital replica of physical assets, processes, people, places, systems and devices that can be used for various purposes. An article explaining the origin, types, advantages and applications of digital twin is explained in the *Knowledge Corner*. A further article explains the application of digital twin on smart buildings.

It is tough surviving the lockdowns imposed during the covid-19 pandemic. Non-essential businesses are not allowed to operate during the Movement Control Orders. Some of these tenants have no choice but to end the tenancies. Many premises have remained vacant due to weak market demand. Property owners with vacant properties are eligible to claim vacancy allowances for sewerage rate and assessment rate from the respective authorities. The criteria and procedure to claim these allowances are outlined in this issue.

Lastly a review on a popular strata management book by Lai Chee Hoe titled *Strata Management Practice & Procedure* is in page 31.

Merry Christmas and Happy New Year!! ■



**Professor Sr Ts Dr. Ting Kien Hwa**

FMIPFM, FRICS, FRISM, MPEPS

*Founding Editor & Editor-in-Chief  
The Property Manager*

MERRY  
**Christmas**  
& HAPPY NEW YEAR



# From the Desk of The President

**A**ssalamualaikum Warahmatullahi Wabarakatuh,  
Salam Sejahtera, Salam Keluarga Malaysia.

It gives me great pleasure to welcome readers to Vol.3 No.4 issue of The Property Manager Journal and the publication for the fourth quarter of 2021.

Alhamdulillah, let us give thanks to Allah SWT who has given us His guidance to start finding a way out of all the chaos of the COVID-19 pandemic and economic slowdown that have plagued the country since the beginning of last year until today.

I would like to express my deepest gratitude to our fellow members of the Malaysian Institute of Property and Facility Managers (MIPFM) who have given me the confidence to lead the leadership of this institution through this challenging time and situation for the session 2021/2023. Once again, with utmost sincerity, I am grateful and thank you.

I would also like to congratulate the new leadership line-up of MIPFM who have been selected to lead MIPFM for the term of 2021/2023. I firmly believe that we can work together in shaping this institution towards an excellent organization.

On this occasion, allow me to express my highest appreciation to the former President and leadership of MIPFM who have led this institution in the past term. Indeed, previous leadership line-up colleagues have set a high benchmark. Thus, I would like to call upon all fellow members of MIPFM to mobilize our energy and ideas in order to accelerate the performance of MIPFM. Let us, with an open mind, build the bridge of unity and harmony in building the organization that we love.



## THE PROPERTY MANAGER

We must remember, the COVID-19 pandemic is still far from over, despite having seen the glimpse light of recovery at the end of the day. This pandemic still exists among the world community, and this pandemic does not choose individuals or religions. Therefore, I would like to advise all valued MIPFM members to always adhere to the guidelines to curb the spread of the COVID-19 pandemic set by the National Security Council (MKN) and the Ministry of Health Malaysia (MOH). Stay safe for the family we love.

The pandemic crisis has had a very serious and far-reaching impact on the world economy, including the domestic economy in Malaysia - the country we love. Various industry sectors, especially small and medium businesses (SMEs) are being impacted. Some have weathered this crisis and some are still struggling to stay in the industry. We at MIPFM should inspire a sense of belonging in helping our fellow members in tackling this crisis. For that purpose, to the affected members, please come forward and share your challenges with the new leadership for us to discuss together in finding the best solution to overcome the crisis.

In addition, the crisis directly calls for a more holistic and proactive approach to property, asset and facilities management in meeting the quality of service delivery expected by customers and stakeholders. I believe that fellow MIPFM members from various educational, community, cultural and professional

backgrounds will be able to contribute fresh inside into highlighting a more effective and lean property, asset and facility management approach to face the current situation.

Nevertheless, integrity and good governance remain the core for any organization to remain strong and relevant at any given time. Efficient financial management by optimizing operating costs and existing resources is the essence for any operator or company to continue to survive and subsequently be able to deal with the critical situation that is rocking the world today.

In these challenging times, we have lost a member who is also a good friend to us, and some of our dear MIPFM members have lost loved ones to the pandemic. Hence, let us dedicate our prayers to those who have gone, and may Allah SWT shower them with forgiveness and mercy.

Last but not least, let us all work together and pray that the economy recovers at an immediate rate. I pray that all valued MIPFM members are always in good health and prosperous at all times. Let us continue to move forward in promoting and upholding the profession of Property Manager, Asset Manager and Facility Manager. ■

**Datuk Sr Haji Kamarulzaman bin Mat Salleh**  
**President 2021/2023**



# DEFECT MANAGEMENT OF STRATIFIED BUILDINGS IN MALAYSIA

VIOLA LETTICE DE CRUZ<sup>1</sup>, ROSHAN KSHATRIYA<sup>2</sup>,  
PAYAM SHAFIGH<sup>3</sup>, KUAN YOU WAI<sup>4</sup>

## INTRODUCTION

**D**uring construction boom, developers, architects, engineers, surveyors, contractors and nominated sub-contractors are busy constructing buildings. Upon the completion of construction, disputes arise on construction claims, quality and other related issues which are settled through arbitration or courts. However, to the ones who are the major stakeholders of the construction boom i.e. the owners of the completed buildings have to face the defects of the building once the building is handed over.

This article discusses the issues related to the defect management of stratified residential buildings in Malaysia from the perspective of building parcel owners and property managers.

## PROVISIONS ON SPECIFICATIONS AND CONSTRUCTION QUALITY

The contractual relationship of parcel owners and developers is created when they enter into a Sale and Purchase Agreement under the purview of Housing and Development (Control and Licensing) Act 1966 [Act 118]. Schedule H in the Act 118 is the standard Sale and Purchase Agreement for stratified residential buildings with standard terms and conditions. It contains First Schedule that outlines the site plan, layout plan, floor plan of the said parcel, storey plan or delineation plan of the said land comprising the said parcel, accessory parcel plan and common facilities plan. Second schedule on the other hand, outlines the list and description

of common facilities and the list and description of services provided. Fourth Schedule outlines the Building Description of the key building components like structure, walls, roof covering etc.

Besides, building codes/laws also set the mandatory safety and construction requirements of the design and building construction. These building codes include:

- Factories and Machinery Act 1967,
- Street, Drainage and Building Act 1974 (Act 133),
- Uniform Building By-Laws 1984 (UBBL 1984),
- Fire Service Act 1988,
- Electrical Supply Act 1990,
- Water Services Industry Act 2006,
- CIDB Act 1994, etc.

UBBL 1984 contains "General Notes" that supplement the mother Act, Act 133. At state level, i.e. Kuala Lumpur and Selangor in particular, there are specific Building By-Laws with some different provisions on building control as compared to UBBL 1984. These building codes are enforced by the respective Authorities mentioned in Schedule H. Thus, these drawings, description and building codes form the backbones of description and construction quality of the buildings. Besides, Clause 14 (Materials and workmanship to conform to description) of the Schedule H stipulates that the parcel and the common facilities shall be constructed in good

and workmanlike manner in accordance with the description set out in the Fourth Schedule and in accordance with the plan approved by the appropriate Authority. Except the appropriate Authority, no one shall alter the construction plans and the house owner is entitled to the building built according to the approved drawings based on the precedent *Sivananthan Krishnan v Jade Homes Sdn Bhd* (2019) 5 CLJ 49, CA. In another landmark case for the definition of “building in a good and workmanlike manner”, namely *Teh Khem On & Anor v Yeoh & Wu Development Sdn Bhd* (1995) 2 AMR 1558, (1995) 2 MLJ 663, HC, the learned judge made a judgement that when a purchaser buys a house from a builder, there are three implied terms:

- a) The builder will do his work in a good and workmanlike manner
- b) He will use good and proper materials
- c) The house will be reasonably fit for human habitation

In the case of *Pua Yu Len & Anor v Bandar Eco-Setia Sdn Bhd*, (2018) 1 LNS 821, HC, the meaning of “good and workmanlike manner” has been further elaborated to relate to the way in which the work is carried out rather than to the materials, and the clause requires that the work shall be carried out with due skill, care and judgment.

### BUILDING DEFECTS

Parcel owners are entitled to premises which are “defects free” with design complied with the relevant building codes, building materials and good workmanship. Nevertheless, due to the labour intensive nature, high complexity and massive scale of construction work, defects are inherent in buildings. From the perspective of construction laws, the term “defect” covers such items which contain any imperfection, shrinkage or any other fault in the works under the contract for which the contractor is responsible. Besides, building defects can be categorized based on patent/latent defects,

quality of materials used, standard of workmanship employed and/or standard of design (Rajoo S. and Singh H. (2012) p468 - 469).

In the context of parcel owners and property managers, defect can be defined as non-compliance to the above mentioned approved drawings, description of building components and covenants in Schedule H. Besides, defects are also related building components which have not been built in good and workmanlike manner.

Clause 30 (defect liability period) [DLP] in Schedule H outlines the procedures in handling defects after vacant possession of the parcels. Parcel owners are required to detect patent defect which is visible and apparent, report the same to the developer and arrange for repair on the cost of the developers within the rectification period of twenty four (24) months from the date of Vacant Possession.

Nevertheless, for common facilities, procedures in handling defects are outlined in Section 92 (Deposit to rectify defects) in the Strata Management Act 2013 [Act 757] and Regulation 46 to 54 of Strata Management (Maintenance and Management) Regulations 2015. The developers shall deposit a sum equivalent to 0.5% of estimated construction costs to form Common Property Defect Account for rectifying defects in common facilities. The account is opened and maintained by the Commissioner of Buildings. Then, according to Section 92(3) above, the Commissioner may use the deposit for the purpose of carrying out any work which is necessary to rectify any defects in the common property of the development areas. However, the persons who can claim against the account for the purpose of rectification of defects in common properties include:

- A purchaser.
- A proprietor,
- A joint management body,
- A management corporation,
- A subsidiary management corporation,



- A managing agent appointed by the Commissioner under subsection 86(1) of the Act, and
- Any other interested person, with the permission of the Commissioner

In the event of rampant building defects and complicated building defects, all the above persons and the Commissioner may not have the time, technical know-how and resources to identify, document and manage these defects. Thus, the Commissioner may appoint a building inspector like registered architects, engineers, surveyors and other experts to identify, document and supervise the defects in common facilities. Such appointment is critical to the success of defect management and it should be funded by the Common Property Defect Account in order to achieve the spirit of Act 118 and Act 757 of protecting the right of home buyers and providing them with safe and harmonious community living.

Standard of repair work has been an ambiguous and questionable as no strict guidelines are in place for this process. Nevertheless, according to precedents like *Teh Khem On & Anor v Yeoh & Wu Development Sdn Bhd (1995) 2 AMR 1558, (1995) 2 MLJ 663, HC*, the repair ought to restore the performance of the affected building components to original state as if no damage/ defect has occurred. Cosmetic and short term solutions must be avoided. Urban Services Division of Ministry of Urban Wellbeing, Housing and Local Government (KPKT) recommends “EN1504 Products and systems for the protection and repair of concrete structures” in the diagnosis and maintenance of concrete structures for restoration of affected building components to their optimum lifespan. Indeed, it is a standard that emphasize on the diagnosis and identification of the root cause(s) of the defects and repair them scientifically so that the service lifespan of the buildings can be restored.

Another shortfall in the current legality in building industry is the “durability” of buildings. This is a

construction quality that implies that the building components shall perform its optimum function during the typical service lifespan. In many instances, it correlates to the warranty period granted by the applicators or manufacturers if the original building components are installed correctly by the trained technicians or operators.

In reality, many premature defects surface after the DLP of 24 months even though the said elements are still within their typical service lifespan or valid warranty. Developers tend to evade such liability, leaving the Management and building owners to inherited defects. Indeed, Defect Liability Period has been wrongly understood as “period whereby developer is liable for defects” or “warranty period”. This is reflected in the case of *Ong Nge Wei & Ors v Kemajuan Masteron Sdn Bhd [2019] 1 LNS 540*. Indeed, defect liability clause is meant to be an additional statutory protection for the house buyers without affecting or limiting their rights under Common Laws. The reliance of DLP as a defense is totally rejected.

In summary, DLP is a rectification period for defect which becomes apparent or patent defects after the vacant possession only. The developer’s contractual duties to deliver buildings in good and workmanlike manner extend throughout the typical service lifespan of the buildings with optimum fitness for purpose, functionality and performance. Any premature failure is regarded as failure to construct the building in “good and workmanlike manner”, Hence a latent defect has been accrued.

## TYPICAL SERVICE LIFESPAN OF BUILDING COMPONENTS

The typical lifespan of building components are:

Structure	designed service lifespan of 90 years to 100 years
Structure	designed service lifespan of 90 years to 100 years
Pipes	15 years
External sealant	5-10 years
Paint on external wall	5 years

The typical service lifespan may vary depending on the manufacturers. Further clarification and confirmation can be obtained from the respective manufacturers and/or licensed applicators.

## LATENT DEFECTS

A new amendment in Latent Defects not involving personal injury in the Limitation (Amendment) Act 2018 was passed and gazetted. The new Section 6A has come in to force on 1st of September, 2019.

Section 6A(2) of Limitation (Amendment) Act 2018 has been introduced to enable a person to take action found on damages for negligence not involving personal injuries, where the starting date for calculating the period of limitation under subsection (2) falls after the date on which the cause of action accrued. An action to which this section applied shall not be brought after the expiration of three (3) years from the starting date if the period of three (3) years expires later than the period of limitation prescribed in subsection 6(1). Notwithstanding subsection (2), no action shall be brought after the expiration of fifteen (15) years from the date on which the cause of action accrued.

consultant revealed that the crack had appeared in 2027 due to missing or misplaced rebars. According to the Limitation (Amendment) Act 2018, the introduction of a new Clause 6A to the Limitation Act 1953, the claimant has three (3) years to file a case to seek his recourse for grievance on 2030. A time bar of fifteen (15) years is allowed in the Clause 6A whereby his right to the recourse ceases on the year of 2042 (refer Figure 2).

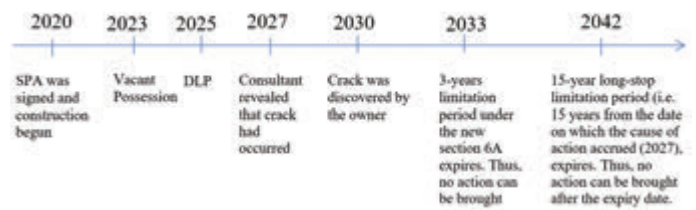


Figure 2: Timelines illustrating the new section 6A in Limitation (Amendment) Act 2018

Source: Y.K. Heng et al, Late Discovery of Latent Damage? Limitation Period has been relaxed by new Section 6A, Legal Network Series [2020] 1 LNS(A) xciii

A major consideration in determination of defect is the cause by typical service lifespan of the affected building components. Upon the service lifespan, the components dilapidated and lose their performance due to fair wear and tear. Vandalism and poor building maintenance can also reduce the service lifespan of the affected building components too.

Most of the building components have limited service lifespan and after 15 years, they need maintenance, refurbishment or replacement. Nevertheless, the Act has a loophole because it is an industrial practice that the structural engineer is liable to the structural integrity throughout the designed service lifespan of the building, typically around 90 to 100 years. What if the cracked was discovered in 2053, thirty (30) years after the VP? From structural engineering point of view, 30 year old structure is considered "young". Should the Section 6A prevail, structural engineer is liable to the structural integrity for 15 years only. Indeed, this is detrimental to the safety of the occupants and owners. Thus, further clarification is required from the Attorney General Chamber or the relevant courts in this matter.



Figure 1: Latent Defects under swimming pool in a 4 year old condominium

For instance, for a new house built in 2020 and handed over in 2023. According to the old Limitation Act 1953, no action can be taken the time bar of six (6) year in 2029. Nevertheless, a structural crack was discovered in 2030. A building report made by a

## FORENSIC INVESTIGATION IN BUILDING DEFECTS AND FAILURE

In the event of suspected Latent Defects, what can a property owner or a building manager do? How can he build up his case and what are the laws related to this exercise? Is an expert a must in building up a case in latent defect?

According to section 101 of the Evidence Act 1950 (Act 56), the burden of proof for negligence on the Plaintiff and the standard of proof is on **balance of probability**, i.e. that it was more probable than not that the Defendant was negligent. If the claimant has the know-how in identifying and recording the defects, he can carry out the investigation by himself. However, being invisible to naked eye, latent defects cannot be detected by visual inspection (refer Figure 3). Thus, an expert is required to prove such failure and the causal links with scientific tools, methods and literature. If the investigation methodology can comply with some internationally accepted testing protocols which have been widely debated and critically reviewed, and conducted by a competent person with duly calibrated tools prescribed in the testing standards, the credibility and merit of such testing can be enhanced.



Figure 3: Building inspection by an infrared thermographic inspector

Section 45 of Act 56 stipulates that when the court need to form an opinion upon a point of foreign law or of science or art, or to identify or genuineness of

handwriting or finger impressions, the opinions upon that point of *persons specially skilled* in that foreign law, science or art, or in questions as to identify or genuineness of handwriting or finger impressions, are relevant facts, such persons are called experts. On the other hand, section 42 of Strata Management (Strata Management Tribunal) Regulations 2015 outlines that a "Tribunal Expert" may be appointed by the Tribunal in search for opinion when deemed fit. Furthermore, Section 42(5) defines "expert", in relation to any question arising in a cause or matter, means any person who has such knowledge or experience of or in connection with that question that his opinion on it would be admissible in evidence.

Order 40A, Rule 3 of Malaysian Rules of Court 2012 outlines the requirements of the expert's reports as follows:

- a. Give details of the expert's qualifications;
- b. Give details of any literature or other material which the expert witness has relied on in making the report;
- c. Contain a statement setting out the issues which he has been asked to consider and the basis upon which the evidence was given;
- d. If applicable, state the name and qualifications of the person which carried out any test or experiment which the expert has used for the report and whether or not such test or experiment has been carried out under the expert's supervision;
- e. Where there is a range of opinion on the matter dealt with in the report:
  - Summarize the range of opinion, and
  - Give reasons for his opinion;
- f. Contain a summary of the conclusion reached;
- g. Contain a statement of belief of correctness of the expert's opinion; and
- h. Contain a statement that the expert understand

that in giving his report, his overriding duty is to the Court and that he complies with that duty (mandatory)

A few considerations must be taken into consideration during the investigation process.

1. '.... duty of expert to assist the court....': the expert has an overriding duty to the court to be wholly impartial in the interest of truth, regardless of the influence of the party who calls him (*Whitehouse v Jordan* [1981] All ER 267 at 276, [1981] 1 WLR 246 at 256, HL, per Lord Wilberforce)
2. "Independent expert evidence": It has been said that the evidence of an expert should not only be independent but 'should not only be independent but 'should be seen to be' independent (see Lord Wilberforce's observations in *Whitehouse v Jordan* [1981] 1 All ER 267 at 276, [1981] 1 WLR 246 at 256, HL, referred to in *Liverpool Roman Catholic Archdiocese Trustee Inc v Goldberg* (No 2) [2001] 4 All ER 950).

Section 6A of Limitation (Amendment) Act 2018 requires the expert appointed to determine and reveal the estimate date of the cause of action accrued attributable in whole or in part to an act or omission that led to *Latent Defect* which is alleged to constitute *negligence*. During the course of investigation in Latent Defects, the appointed expert shall assist the court to determine the causal link that lead to the defects and identify the contributing parties and contributory factors to the defects must be identified. As latent defect is not visible by naked eyes, tests and experiments are integral for the reports and they can enhance the weight and credibility of the reports to the courts. The investigation process starts with deciding on a testable hypothesis, review of historical data/service record, access to the site for preliminary review, execution of testing and/or destructive inspection, collection of data, analysis of data and preparation of report. If the testing is not consistent to the hypothesis and earlier observation, a review of the

process is needed and another round of testing is necessary (refer Figure 4).

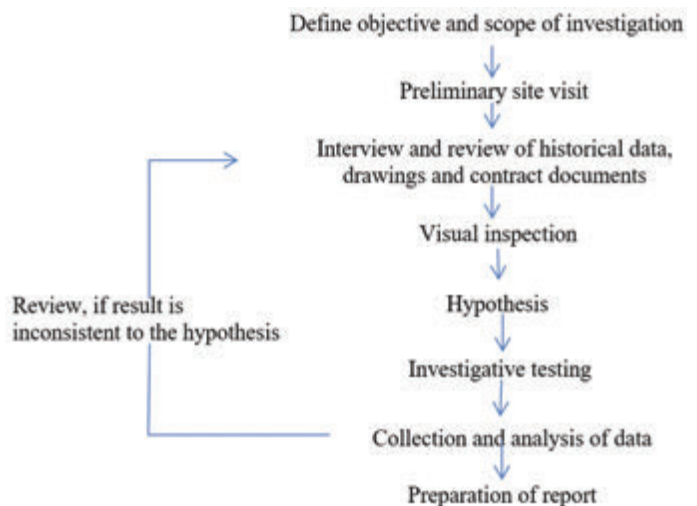


Figure 4: Typical forensic investigation process

With the rapid advents in Non-Destructive Testing and Inspection (NDT), building elements have their respective standard for testing. These methods have gone through extensive peer review and produce reliable accuracy and consistent result. Among the prominent and internationally recognized professional bodies which have developed a number of testing methods include:

- a. America Society for Testing and Materials (ASTM)
- b. British Standard Institute (BSI)
- c. American Architectural Manufacturers Association (AAMA)
- d. European Committee for Standardization (ECS)
- e. Hong Kong Concrete Institute (HKCI)

These independent bodies publish numerous guidelines for field testing of different building components which is substantiated by empirical scientific studies. Thus, the appointed expert can opt to carry out these tests in order to build up the case with linkage of events, contributing parties and contributory factors that lead to the defects.

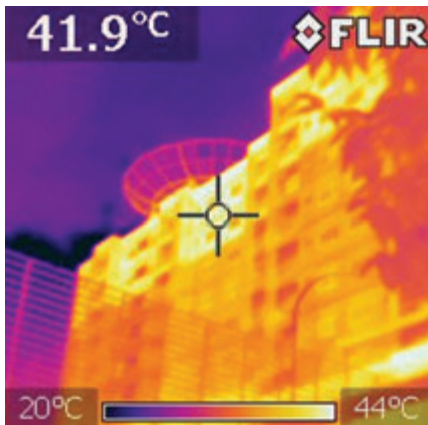


Figure 5: HKCI:TM1 Detection of irregularities, debond and delamination using Infrared method

The tests and experiments must comply with the prescribed procedures strictly and conducted with calibrated equipment and competent persons (refer Figure 5). Thus, verification to calibration certificates, method of calibration and credibility of laboratories for calibration must be done. The competency level and validity of the competency of the testing technician or experts must be verified, too.

In the event of diagnosis of concrete structures in stratified buildings, KPKT recommends “EN1504 Products and systems for the protection and repair of concrete structures. Definitions, requirements, quality control and evaluation of conformity”. It contains comprehensive methods that diagnose and repair the concrete structures holistically including the concrete matrix and the reinforcement steel bars with the objective to restore concrete health of the affected structures.

Appended below is a list of established NDT testing in forensic investigation in water penetration, dampness and moisture:

Building element	Testing Protocols
Concrete flat roofs	ASTM C1153 - 10(2015) Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging
Waterproofing in indoor wet areas	ASTM D5957-98(2013): Standard Guide for Flood Testing Horizontal Waterproofing Installations

Curtain walls, windows, skylights and other fenestrations	ASTM E1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference
	AAMA 511 Voluntary Guideline for Forensic Water Penetration Testing of Fenestration Products
Building walls	ASTM E2128 - 20 Standard Guide for Evaluating Water Leakage of Building Walls
Domestic pipes	Testing and Commissioning protocol in the Uniform Technical Guidelines of Water Reticulation and Plumbing, Suruhanjaya Perkhidmatan Air Negara
Concrete cover	Cover meter
Mapping of Corrosion	ASTM C 876 – 09 Half Cell Corrosion Mapping
Rebars mapping and scanning	Ground Penetrating Radar
Identification of cracks	BS 1881 : Part 203 : 1986 / BS EN 12504 : Part 4 : 2004 Ultrasonic Pulse Velocity

## LITIGATION PROCESS OF LATENT DEFECTS AND OTHER DISPUTES

Litigation process is stressful, time consuming and costly. Any avenue to resolve the dispute amicably must be attempted and exhausted before one opts to proceed to the tribunal or court. It ought to be the last recourse after diligent efforts are made in mediation, negotiation for settlement.

A mediation session under the assistance of mutually selected experts may expedite the process without incurring high legal costs. Complaints to the disciplinary committees of the relevant Boards (Board of Architects Malaysia and Board of Engineers Malaysia) may trigger investigation and disciplinary actions against the relevant professionals.

Since the local government is the custodian of building safety, a complaint should be lodged to the “Yang Dipertua” or the Mayor in charge for further direction. One may also seek second opinion for an independent evaluation and inspection if such need arise.

Notwithstanding the guidance by the local authorities, appended hereunder are provisions in Act 133 and UBBL 1984 pertaining to building failure:

Section 71 (Penalty for failure of building or earthwork) of Act 133 outlines that where any building or part of a building fails, whether in the course of construction or after completion, or where there is any failure in relation to any earthworks or part of any earthworks or after completion thereof, and the cause of such failure is due to any one or more of the following factors:-

- a. Misconstruction or lack of proper supervision during construction
- b. Misdemeanor or miscalculation; or
- c. Misuse,

of such building or part of such building, or of such earthworks or part of such earthworks, the person responsible for

- a. such misconstruction or such lack of proper supervision;
- b. such misdemeanor or miscalculation; or
- c. such misuse

shall be liable on conviction to a fine not exceeding five hundred thousand Ringgit (RM500,000.00) or to imprisonment for a term not exceeding ten (10) years, or both.

Section 258 of UBBL 1984 also has provisions in the SOP in handling suspected building failure as follows:

The qualified person who-

- a. Submitted the plans, drawings or calculations for such building;
- b. Supervise the setting out of such building;
- c. Certified that the setting out was carried out in accordance with the approved site plan;
- d. Supervised the construction of such building;
- e. Certified that the proper supervision of such building as carried out;

shall within one week of the occurrence of such failure or such further period as may be specified by the local authority within whose jurisdiction such building is situated

- a. report such failure
- b. explain the cause of failure; and
- c. if such failure occurred during the construction of such building, state the remedial action taken.

Both the mother Act and By-Laws, namely Act 133 and UBBL 1984 have provisions in building failure. Indeed, building failure refers to the major defects which materially affect the safety, fitness of purpose and functionality of the buildings in hand. However, having the Qualified Person to investigate defects lacks independence which is essential in the unbiased judgment to the suspected building failure. In reality, a second opinion by an independent expert is essential in order to have an objective opinion.

Upon exhaustion of all amicable avenues to resolve the dispute, one may opt to pursue their grievance to the relevant Tribunals or Civil Court, depending on the quantum of claim for restoring the aggrieved party to a position as if no damages have occurred.

For latent defects in common areas, the question of jurisdiction must be contemplated. There are 2 views

whether the claim of latent defects could be filed in the Strata Management Tribunal.

The first view states that it can be done as there is no limitation period in the SMT and the developer is a person enlisted as persons entitled to file a claim under s.107(1).

However, the second view deems the former too simplistic and fails to appreciate the purpose of the SMA. In reference to the long title of the Act, the purpose of the Act is the proper maintenance of buildings common property, property management and dealing with matters that are incidental to or as a consequence of the proper maintenance and management of the common property. To support the argument, reference is made to the second paragraph of the fourth schedule where the para makes a dispute on cost or repairs in respect of a defect in parcel or common property subject to **s.16(N)(2) of Act 118**. It is argued that the dispute on cost or repairs as stated in para two here is attributed to a 3rd party like a proprietor in an inter-floor leakage issues etc.

S.16(N)(2) of Act 118 speaks about the jurisdiction of the Homebuyers Tribunal that deals with any matter arising from the Sales & Purchase agreement entered into between the homebuyer and the housing developer. Hence, the subject matter of latent defects also arises from the Sales & Purchase agreement.

But due to the limited time period in the housing tribunal, along with the limited monetary jurisdiction, it is better if purchasers bring the claims for latent defects to court.

The JMB and MC established under the SMA are not parties to the sales and purchase agreement and therefore non-parties may not interfere in legal actions unless sanctioned by law (Boustesd Navcal Shipyard Sdn. Bhd v. Dynaforce Corporation Sdn. Bhd (2017) 5 CLJ 533).

However, if the proprietors intend to bring an action together for the latent defects, it is argued that they could, by virtue of s.143(2) SMA allow the JMB or MC to represent them in the proceedings.

For latent defects inside the parcel, it must be referred to the relevant court due to the limited jurisdiction of the Tribunal of Home Buyer Claim.

## CONCLUSION

Defects cannot be defined in isolation. Indeed, they can only be defined by reference to applicable building codes, contract provisions (expressed or implied) and the relevant industrial practices. Although defects are unavoidable, the underlying root cause of the defects should be addressed by the developers diligently and professionally with the aim of restoring the service lifespan, instead of cosmetic repair.

In many instances, some seemingly small oversights during the design and construction process can lead to building defects and failures with devastating consequences. Thus, mindset in Quality Assurance for doing things right in the first place, continuous learning and improvement from mistakes in the past can reduce and control defects to a manageable level.

The avoidance of errors that can result in construction defects and failures is the responsibility of everyone working in the construction and engineering industry. Reasonable level of duty of care in prevention of defects is vested on all parties involved. With the rise of awareness in consumer rights and more enactment of relevant legislations, it is better to safeguard one's reputation by giving more efforts in QAQC (Quality Assurance and Quality Control) and continuous improvement in all stages of design, construction and rectification of the building construction.

In the context of defect management, "prevention is better than cure". ■

1. **Viola Lettice De Cruz (LLB, Barrister-at-Law. A member of the Honorable Society of Inner Temple, London and Managing Partner of V. L. DeCruz & Co.)**
2. **Roshan Kshatriya (LLB, University of London. A senior legal counsel in various government agencies and former Head of Legal & Claim Division of TPPS)**
3. **Assoc Prof Dr Payam Shafiqh (Department of Architecture, Faculty of Built Environment, University of Malaya)**
4. **Kuan You Wai (An instructor in Inter-floor Leakage, Building Pathology and EN1504 Products and Systems in Protection and Repair of Concrete Structures)**

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# 5G AND ITS IMPACT ON REAL ESTATE

TING PHIN JECK

## INTRODUCTION

Digital disruption is on course and among the key factors that drives Industrial 4.0, the 5G rollout will be the enabler. 5G will enable devices, buildings and cities to be linked together. It will transform the way we live, work, travel and play in the near future.

What is the big deal about 5G? Most people may know that it has something to do with the internet, but what is it exactly? Which industries does it affect and does it affect the real estate industry?

5G means the fifth generation of cellular technology (relating to a mobile telephone system that uses a number of short-range radio stations to cover the area that it serves). Society has seen a massive increase in gadgets that are interconnected and video streaming services. Think about all the smart gadgets from smart

watches to self-driving cars, and streaming services such as YouTube and Netflix. This brings about the requirement of higher bandwidth. More people plugged in means cellular service in crowded areas will become spotty. 5G could solve all this problem.

But how fast is 5G exactly? In theory, 5G could reach speeds that are 20 times faster than 4G LTE1. 4G LTE has a peak speed of 1GB per second whereas 5G could reach speeds of 20GB per second (refer Figure 1). These are theoretical peak speeds and real world performance will vary. 5G also has low latency meaning a device could respond a lot faster with other devices over a network. This means no lag between transmissions. 5G also has technologies that enable many more devices to be plugged in without suffering from loss of speed. With high connection speed, 5G is an enabler of a new host of connectivity and smart devices, affecting many facets of our

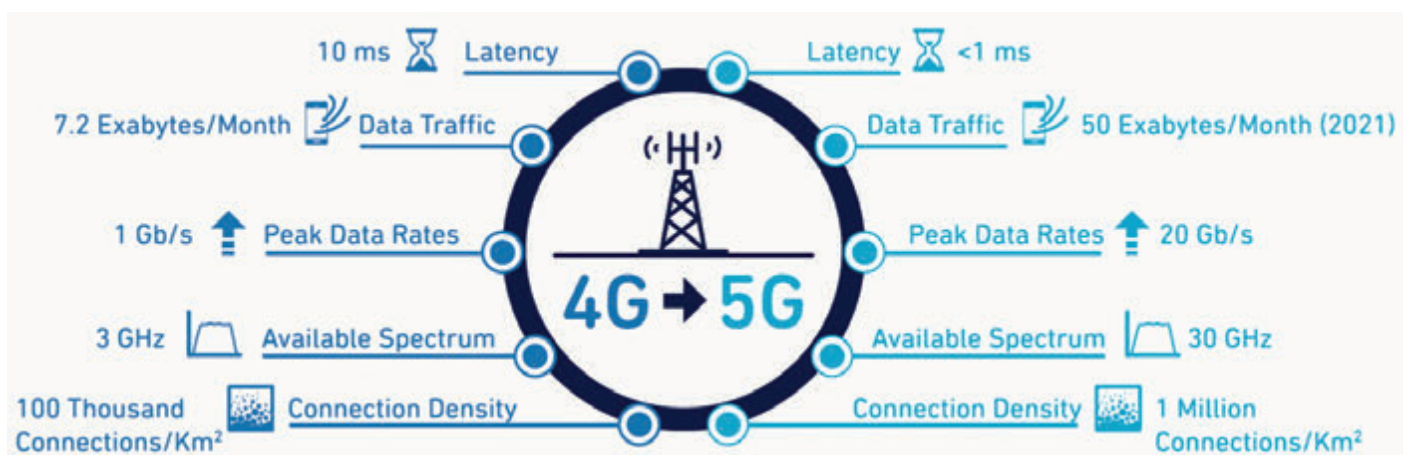


Figure 1: Comparing 4G and 5G

Source: Qorvo (2017) Getting to 5G: Comparing 4G and 5G systems requirements, September

lives and industries. In particular, 5G enables the applications of transformational technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Augmented & Virtual Reality (AR & VR) and Digital Twins all of which could have a significant impact in digitalizing various sectors.

This begs the question, how does 5G affect the real estate industry?

Some of the impacts are as follows:

## 1. Smart Homes and Buildings

5G will enable the implementation of next level smart homes and buildings. Devices that can be linked up and controlled via a central hub or be automated includes things like thermostats, security cameras, lights, doors, windows etc. Lower latency and bandwidth mean that smart home devices can be controlled with minimal delay. For commercial buildings, the instant monitoring of mechanical and electrical systems such as safety devices like sprinklers and gas systems to enable quick response will be a boon.

## 2. Sought after Remote Offices

Offices typically utilise programs and documents. This means massive amounts of data is sent back and forth between remote offices and their company HQs or online clouds. If there is lag in this process, it affects productivity. 5G accessible offices may not have this problem.

## 3. Augmented Reality (AR)

AR will facilitate real estate sales in the future as viewing in 3D will be more immersive than the 2D format. Interior design options using different furniture and furnishing can be tested by the potential buyer. AR features that require substantial internet speed to load over computers and handphones could be solved using 5G transmission.

## 4. Flexibility to live and Work in Remote Locations or from Home

One thing that the Covid-19 pandemic has taught us is that it is viable for employees of certain companies to work from home. If 5G coverage extends beyond major cities, people have the choice to live and work from home in more rural areas. Apart from their occupation, things like telehealth and autonomous vehicles enabled by 5G will make that choice possible as medicine and shopping could be done online and autonomously.

## 5. Retail sector

A much-needed retail revolution could start with virtual reality and augmented reality to create experiential retail environments and be further developed by in-store analytics to personalize shoppers' experiences.

## 6. Opportunities for more rental income

5G signals travel shorter distances than those of 4G networks. This means that 5G antenna and booster are required and these hotspots could increase rental income for property owners as telcos will be looking to lease rooftop spaces to install cell towers.

The implementation of 5G is not all sunshine and rainbows though. 5G requires the installation of small cell base stations (the small cell antennas transmit and receive the higher band radio frequency spectrum) and RAN cell towers (RAN focuses on mid- and lower-band radio frequencies) which could cause eyesores and devalue certain properties. Complaints on the poorer cityscapes with these 5G installations will certainly rise with its roll out in the near term. ■

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# WHAT IS PREDICTIVE ANALYTICS?

**P**redictive analytics is a technology that spans over techniques like data mining, modeling, statistics, artificial intelligence, and machine learning. With the help of data mining, analytical techniques, and predictive modeling, the technology holds together the business management, modeling process, and information technology that help in making decisions about the future.

Predictive analytics tools capture the risks and opportunities from the patterns found in the history and transactions of the business to interpret the big data predictive analytics to their advantage.

## WHY PREDICTIVE ANALYTICS

Predictive analytics is a branch of advanced analytics that helps users to predict unknown events in the future. The analysis is an easy-to-use process by using advancing technology through smarter and faster computers. The need for an intelligent strategy to beat the tough economic conditions and competition in the market led to companies adapting to predictive analytics tools. Such analyses:

- **Reduces Risk**

Predictive analytics identifies risks through the business history and makes it easier to eliminate or prevent any recurring risk factors, like insurance claims and collection-based aspects. It also gives an estimate of the buyer's probable purchases in the future with the help of credit scores. With the help of predictive analytics tools, a buyer's credit score is interpreted depending on his creditworthiness.

- **Detects Fraudulence**

With a review of the business history, predictive analytics can identify criminal behavior and also enhance the overall pattern detection. The increased need for cyber security is catered to by predictive analytics tools that examine real-time activities that eliminate fraud, threats, and vulnerabilities.

- **Enhances Marketing Campaigns**

The basis of predictive analytics is to predict customer purchases and ultimately boost sales. Using the cross-selling techniques, businesses can not only retain customers but also attract new ones.

- **Makes Operations More Efficient**

Big data predictive analytics also help in managing resources in businesses especially for service-based businesses. For instance, airline companies use predictive analytics to set ticket prices, and hotels use it to determine the average number of guests per night that helps in maximizing occupancies and amplifying revenues.

## THREE BASIC MODELS IN PREDICTIVE ANALYTICS

Marketers need to be aware of these three predictive models to make their operations smooth and efficient:

### (a) Clustering Models

In this type of predictive model, the main element is the algorithm which helps in creating customer segments. These clusters could be categorized based

on the behavioral patterns of customers, products purchased by different age groups, and brands that need to be pitched to specific customers, depending on their browsing and shopping histories.

## (b) Propensity Models

The propensity model is a typical feature of predictive analytics that helps in determining customer's future purchase. Propensity algorithms can determine how long a particular customer is retained, how much the customer is likely to spend on purchases made with you, whether or not the customer is interested in reading e-mails sent to them, or if they are likely to unsubscribe from your thread.

These models also determine which of these customers are ready for a purchase, so that you can reach out to them in time. You can also identify high-value customers whom you are likely to lose and reduce the risk factor in your business operations.

## (c) Collaborative Filters

In layman's terms, collaborative filters are *recommendations*. These predictive analytics techniques are commonly found on most eCommerce websites, where a buyer comes across suggestions of products that other customers bought along with the particular product.

These filters are mainly of three types. The Up-Sell recommendations are suggestions made to customers at the time of purchase to buy a higher version or probably a multipack of the same product. Cross Sell recommendations suggest you buy products that are typically bought as a set with this product. The Next Sell recommendation is a suggestion that is sent after the purchase has already been made, generally through the confirmation e-mail.

## WHERE PREDICTIVE ANALYTICS IS USED

The advancement in technology and change in markets has led to every business, irrespective of the

field, to take to big data predictive analytics. Here are some of the popular fields that have actively been using predictive analytics tools in improving their performance and in turn revenue:

- **Finance**

Risk management is a great concern when it comes to banks and other financial institutions, with huge amounts of money at stake. Predictive analytics helps in the detection of fraud and credit risks. The algorithms identify frauds and risks within a few seconds, while also maintaining a high efficiency. It also helps in amplifying the cross-sell and up-sell opportunities, while also focussing on retaining customers.

- **Retail**

Retail outlets, be it lifestyle stores or simply the grocers, use predictive analytics to determine what products and the amount to stock up on. The algorithms study consumer purchase patterns and help determine the likelihood of a particular customer's purchases. They also help to check how effective your promotional offers have been and the probability of customers responding positively to future promotions.

- **Utilities**

Industries that deal with fuel, energy, and water supplies have greatly benefitted from predictive analytic models. Whether it's to determine the risk factors that are likely to crop up, mitigate safety throughout operations, predict equipment failures, or even interpret resource needs for the future, these organizations have been backed by predictive analytics.

- **Government**

Government and Public Sectors have also taken to predictive analytics when it comes to detecting and preventing counterfeits, analyze population trends, understand consumer needs, and enhance their overall service.

• **Healthcare**

Health insurance organizations deal with plenty of fraudulent insurance claims. Predictive analytics helps identify them. The technology is also being used to identify patients suffering from chronic diseases and the interventions required to treat them.

• **Manufacturers**

Identifying factors that reduce quality in production and the optimization of service and distribution are some of the areas that predictive analytics comes in handy for businesses that are solely into manufacturing.

**PREDICTIVE ANALYTICS MODELING TECHNIQUES**

Predictive models generally use results that have already been accumulated to determine values for

the future. Inputs from the consumer behavior and purchase history help interpret the probability of revenue in the future. Three of the most commonly used predictive analytics models are:

**(a) Decision Tree**

An easy to understand and interpret model, the decision tree, much like its name suggests, represents alternatives through branches. These alternatives further branch out to decisions or solutions. Decision trees are especially helpful when there are a number of missing attributes in the analysis.

**(b) Regression**

This model is specifically used to study patterns that are intended to follow a normal distribution. This method helps in making a rough estimate of unknown values.

**(c) Neural Networks**

A more complex model that makes use of results derived from simpler strategies like the decision tree or regression, a neural network is capable of modeling complex relationships too. They make use of pattern recognition and artificial intelligence processes to represent the model graphically.

Other techniques include bayesian analysis, gradient boosting, support vector machine, K-nearest neighbor, and time series data mining.

If your business has a problem at hand, all you need is data that can be modeled to give you a prediction for the future and how you can overcome not just the problem, but also the risks associated with it.

In short predictive analysis helps to model a strategy that reduces risks, eliminates frauds, amplifies revenues, and makes business operations run smooth and efficiently. ■

Source: Excerpt from: <https://www.intelligencenode.com/blog/definitive-guide-predictive-analytics/>

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# PREDICTIVE ANALYTICS FOR SUCCESSFUL RETAIL STORES

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**B**rick & mortar retail has been the backbone of global consumer commerce for decades. Even as ecommerce channels gain traction with mainstream shoppers, more than 85% of consumer retail sales still go through brick and mortar locations. That said, no industry has ever stayed relevant by resting on its laurels. Leading retail professionals understand the importance of leveraging modern technology to sustain profitability, and predictive analytics in retail is one such solution.

While not precisely a crystal ball, predictive analytics in retail can reveal how customers explore shopping environments, interact with products, and make purchasing decisions. Despite the obvious benefits of that kind of data, many retailers are unaware of the full spectrum of predictive analytics retail insights they could have at their fingertips.

### WHAT ARE PREDICTIVE ANALYTICS IN RETAIL?

Predictive analytics are a form of statistical analysis that use data mining, statistical modeling, and machine learning to extrapolate trends from historical facts and current events. The practice is shared across industries and educational fields, but retail enterprises typically use it for risk assessments and decision-making.

When retailers first adopted predictive analytics, they analyzed sales data to determine ideal price points and promotional strategies. Today, predictive analytics in retail are exponentially more complex, covering loyalty metrics, store sizes, consumer demographics, inventory management, product assortment, and much more. The good news is

technology makes it far easier for retail brands to monitor factors that contribute to a successful sale. The bad news is competitors can also often access these tools, making it difficult to stand out in a crowded market.

As a result, retailers are looking for new ways to understand their target market and differentiate their offerings. One of the most promising techniques is to analyze the in-store experience, mapping the complete customer journey — literally and figuratively — to understand key engagement factors. With these insights, retailers can structure retail store layouts, optimize pricing, and manage inventory in ways that maximize sales and customer satisfaction.

### HOW CAN RETAILERS OBTAIN DATA?

Modern retailers can find relevant data from any number of sources. Most focus on point-of-sale transactions - whether in-store or online - to understand what products move at a particular price. The most effective predictive analytics strategies link POS data to a broader customer journey through website profiles, loyalty programs, or even social media interactions.

If retailers want to go a step further, they can invest in infrastructure that maps the in-store customer experience. This approach lets storefronts track how customers use and travel through a particular space. This typically requires three components:

- (a) **Building a digital twin:** A digital twin is a 1:1 computer-based recreation of a physical location — in this case, a retail store. It can display the

various shopping categories, how products are arranged on shelves, and even interior lighting effects.

- (b) **Install online-connected sensors:** With simple Internet-of-Things compatible sensors, retailers can connect their storefront to a corresponding digital twin and update details in real-time.
- (c) **Generate visualizations and reports:** The digital twin lets analysts create visualizations and detailed reports of in-store activity. For example, it could chart customer paths as they arrive, navigate the store, and exit through checkout.

Retailers can analyze their data as individual metrics or contrast them with other data sets. For example, combining foot traffic with sales data tells you what categories a customer shopped at — and which ones they ignored during their journey. Examples of predictive analytics retail insights include:

#### (a) Measuring foot traffic

Foot traffic is an essential measurement for predictive analytics in retail stores. In its simplest form, it lets retailers visualize how customers move through the entire shopping floor. When supplemented with other data, foot traffic can provide insights into the impact of promotional campaigns and in-store displays.

Outside of the digital twin, retailers can analyze foot traffic in real-time with positional tracking systems that chart shopping paths. This data is typically visualized as a heat map where aisles with the heaviest use display the brightest colors. Any given visualization presents the highest volume spaces, signifying anything from popular sales to unintended congestion points. Machine learning processes can analyze the traffic in detail to provide more focused insights.

Foot traffic analysis can inform decision-making processes in many ways, from identifying display locations to managing inventory layouts. In the wake of COVID-19, these tools inform social distancing strategies that reduce gridlock in busy aisles. Some predictive analytics tools can even simulate foot traffic, which helps retailers find storefront configurations that maximize revenue and customer safety.

#### (b) Forecasting demand

Predictive analytics doesn't just highlight customer behavior; it sheds light on product trends as well. Any given retail storefront houses tens of thousands of products across its customer-facing shelves and inventory storage. Predictive analytics systems take historical sales data, identify trends, and predict when they will reoccur.



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Forecasting product demand has two primary benefits. First, retail decision-makers can use these insights to optimize inventory, either by assigning more shelf space or featuring the product in prominent display areas. Second, it lets retailers flag items for frequent restocking. If a digital twin monitors inventory, employees can prioritize bringing out specific items long before customers ask about them.

## (c) Optimizing pricing

Knowing which products will be in demand is one thing - knowing how much customers will pay for them is another. Some customers will purchase their favorite items at any price. Others will wait until a sale begins, some will buy in bulk, and others focus exclusively on specific product sizes. And that's before we consider competitor prices and how they influence buying decisions.

Developing a pricing strategy for any retail environment is challenging, but predictive analytics does offer some solutions:

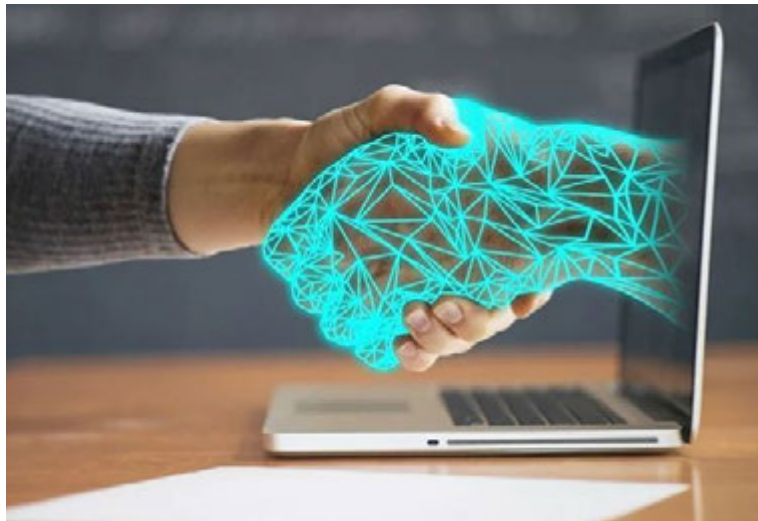
- **Standard price:** Machine learning systems can calculate the right time to reduce a price or when it should increase.
- **Discounts:** Historical data can reveal the ideal promotional discount that encourages customers to try a new product.
- **Sale frequency:** If products have frequent discount sales, customers may avoid buying them at the standard price. Analyzing sales data can determine a promotional frequency that maximizes customer engagement. ■

Source: Excerpt from <https://www.resonai.com/blog/predictive-analytics-in-retail>.





# DIGITAL TWIN: WHAT IS IT AND HOW DOES IT WORK?



**A** digital twin is a virtual model designed to accurately reflect a physical object. The object being studied — for example, a wind turbine — is outfitted with various sensors related to vital areas of functionality. These sensors produce data about different aspects of the physical object's performance, such as energy output, temperature, weather conditions and more. This data is then relayed to a processing system and applied to the digital copy.

Once informed with such data, the virtual model can be used to run simulations, study performance issues and generate possible improvements, all with the goal of generating valuable insights — which can then be applied back to the original physical object.

## DIFFERENCES BETWEEN DIGITAL TWINS AND SIMULATIONS

Although simulations and digital twins both utilize digital models to replicate a system's various processes, a digital twin is actually a virtual

environment, which makes it considerably richer for study. The difference between digital twin and simulation is largely a matter of scale: While a simulation typically studies one particular process, a digital twin can itself run any number of useful simulations in order to study multiple processes.

The differences don't end there. For example, simulations usually don't benefit from having real-time data. But digital twins are designed around a two-way flow of information that first occurs when object sensors provide relevant data to the system processor and then happens again when insights created by the processor are shared back with the original source object.

By having better and constantly updated data related to a wide range of areas, combined with the added computing power that accompanies a virtual environment, digital twins are able to study more issues from far more vantage points than standard simulations can — with greater ultimate potential to improve products and processes.

## TYPES OF DIGITAL TWINS

There are various types of digital twins depending on the level of product magnification. The biggest difference between these twins is the area of application. It is common to have different types of digital twins co-exist within a system or process. The types of digital twins

### (a) Component twins/Parts twins

Component twins are the basic unit of digital twin, the smallest example of a functioning component. Parts twins are roughly the same thing, but pertain to components of slightly less importance.

### (b) Asset twins

When two or more components work together, they form what is known as an asset. Asset twins let you study the interaction of those components, creating a wealth of performance data that can be processed and then turned into actionable insights.

### (c) System or Unit twins

The next level of magnification involves system or unit twins, which enable you to see how different assets come together to form an entire functioning system. System twins provide visibility regarding the interaction of assets, and may suggest performance enhancements.

### (d) Process twins

Process twins, the macro level of magnification, reveal how systems work together to create an entire production facility. Are those systems all synchronized to operate at peak efficiency, or will delays in one system affect others? Process twins can help determine the precise timing schemes that ultimately influence overall effectiveness.

## HISTORY OF DIGITAL TWIN TECHNOLOGY

The idea of digital twin technology was first voiced in 1991, with the publication of *Mirror Worlds*, by David Gelernter. However, Dr. Michael Grieves (then on

faculty at the University of Michigan) is credited with first applying the concept of digital twins to manufacturing in 2002 and formally announcing the digital twin software concept. Eventually, NASA's John Vickers introduced a new term — “digital twin”— in 2010.

However, the core idea of using a digital twin as a means of studying a physical object can actually be witnessed much earlier. In fact, it can be rightfully said that NASA pioneered the use of digital twin technology during its space exploration missions of the 1960s, when each voyaging spacecraft was exactly replicated in an earthbound version that was used for study and simulation purposes by NASA personnel serving on flight crews.

## ADVANTAGES AND BENEFITS OF DIGITAL TWINS

### Better R&D

The use of digital twins enables more effective research and design of products, with an abundance of data created about likely performance outcomes. That information can lead to insights that help companies make needed product refinements before starting production.

### Greater efficiency

Even after a new product has gone into production, digital twins can help mirror and monitor production systems, with an eye to achieving and maintaining peak efficiency throughout the entire manufacturing process.

### Product end-of-life

Digital twins can even help manufacturers decide what to do with products that reach the end of their product lifecycle and need to receive final processing, through recycling or other measures. By using digital twins, they can determine which product materials can be harvested.

## DIGITAL TWIN MARKET AND INDUSTRIES

While digital twins are prized for what they offer, their use isn't warranted for every manufacturer or every

product created. Not every object is complex enough to need the intense and regular flow of sensor data that digital twins require. Nor is it always worth it from a financial standpoint to invest significant resources in the creation of a digital twin. (Keep in mind that a digital twin is an exact replica of a physical object, which could make its creation costly.)

On the other hand, numerous types of projects do specifically benefit from the use of digital models:

- **Physically large projects** Buildings, bridges and other complex structures bound by strict rules of engineering.
- **Mechanically complex projects** Jet turbines, automobiles and aircraft. Digital twins can help improve efficiency within complicated machinery and mammoth engines.
- **Power equipment** This includes both the mechanisms for generating power and transmitting it.
- **Manufacturing projects** Digital twins excel at helping streamline process efficiency, as you would find in industrial environments with co-functioning machine systems.

Therefore, the industries that achieve the greatest success with digital twins are those involved with large-scale products or projects:

- Building construction
- Engineering (systems)
- Automobile manufacturing
- Aircraft production
- Railcar design
- Manufacturing
- Power utilities

## DIGITAL TWIN MARKET: POISED FOR GROWTH

The rapidly expanding digital twin market indicates

that while digital twins are already in use across many industries, the demand for digital twins will continue to escalate for some time. In 2020, the digital twin market was valued at USD 3.1 billion. Some industry analysts speculate it could continue to rise sharply until at least 2026, climbing to an estimated USD 48.2 billion<sup>1</sup>.

## APPLICATIONS

Digital twins are already extensively used in the following applications:

### Power-generation equipment

Large engines — including jet engines, locomotive engines and power-generation turbines — benefit tremendously from the use of digital twins, especially for helping to establish timeframes for regularly needed maintenance.

### Structures and their systems

Big physical structures, such as large buildings or offshore drilling platforms, can be improved through digital twins, particularly during their design. Also useful in designing the systems operating within those structures, such as HVAC systems.

### Manufacturing operations

Since digital twins are meant to mirror a product's entire lifecycle, it's not surprising that digital twins have become ubiquitous in all stages of manufacturing, guiding products from design to finished product, and all steps in between.

### Healthcare services

Just as products can be profiled through the use of digital twins, so can patients receiving healthcare services. The same type system of sensor-generated data can be used to track a variety of health indicators and generate key insights.

### Automotive industry

Cars represent many types of complex, co-functioning systems, and digital twins are used extensively in auto design, both to improve vehicle performance and increase the efficiency surrounding their production.

# THE PROPERTY MANAGER

## Urban planning

Civil engineers and others involved in urban planning activities are aided significantly by the use of digital twins, which can show 3D and 4D spatial data in real time and also incorporate augmented reality systems into built environments.

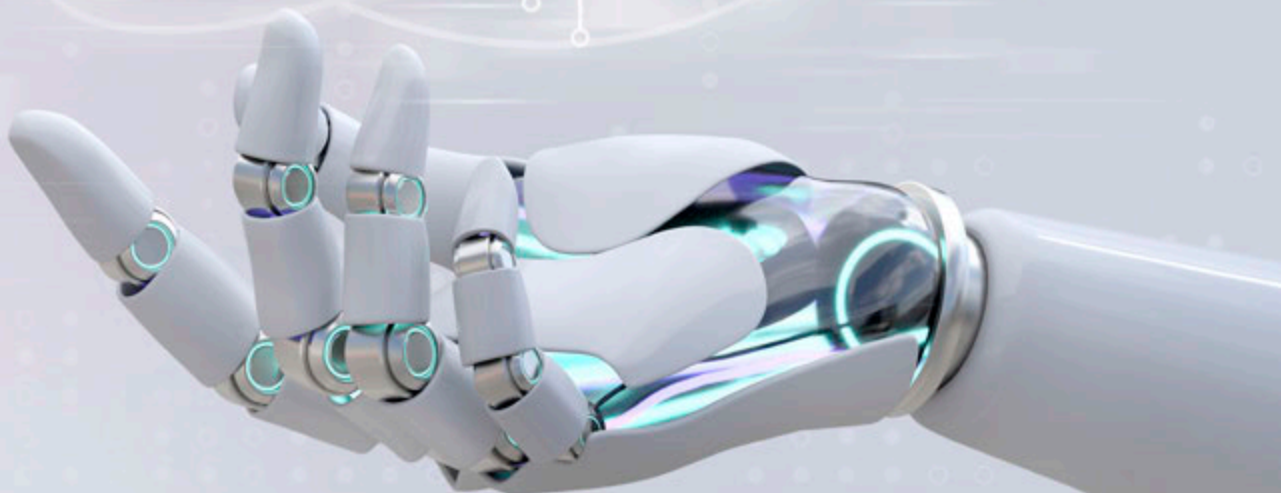
## THE FUTURE OF DIGITAL TWIN

A fundamental change to existing operating models is clearly happening. A digital reinvention is occurring in asset-intensive industries that is changing operating models in a disruptive way, requiring an integrated

physical plus digital view of assets, equipment, facilities and processes. Digital twins are a vital part of that realignment.

The future of digital twins is nearly limitless, due to the fact that increasing amounts of cognitive power are constantly being devoted to their use. So digital twins are constantly learning new skills and capabilities, which means they can continue to generate the insights needed to make products better and processes more efficient. ■

Source: <https://www.ibm.com/topics/what-is-a-digital-twin>



# DIGITAL TWINS AND SMART BUILDINGS



**A** digital twin is a digital replica of physical assets, processes, people, places, systems and devices that can be used for various purposes. The digital representation provides both the elements and the dynamics of how the Internet of things devices operate and live throughout its life cycle.

Digital twin virtual representation of the physical building is embedded with rich information about spaces and assets and can offer significant benefits to building owners.

The immediate access to data and schematics about how a building is performing can enable owners and operators to manage assets, energy, space and comfort in a free-flowing manner inside of a single building or an entire portfolio of properties.

Some of the best use cases for digital twins have emerged in the often disjointed design and construction process where a loss critical information creates many gaps.

During the design and construction of a building, a considerable amount of information is produced such as drawings, documents and notes, however maintaining and finding this information after construction is often very costly and time-consuming.

Imagine the amount of time it takes a building operator to sift through the documentation to identify how particular areas were constructed to identify an underlying problem inside the building's infrastructure. While, in the meantime, the building or its occupants continue to suffer as the problem or failure persists.

The digital twin serves as much more than just a database or schematic and is a dynamic, expressive real-time system of record.

While an operator may know that a part needs to be replaced and space needs to be reconfigured, often times it impossible to find the data necessary to make cost-prohibitive decisions. With a digital twin, the process can be easy and reduced from weeks and months to hours.

## THE PROPERTY MANAGER

Whether it's data generated by an asset, space, lease, maintenance management systems or data from IoT, a digital twin can act as the hub to integrate information provide context to it and generate insights that help to optimize building performance by eliminating silos.

As more builders create digital twins of properties, it eases labor costs related to the facility management. If an air condition system needs repair - using a digital twin the technician can not only find the fault location on smartphone or tablet but can also better troubleshoot the problem using data captured in the twin. In cases where on-site visits are costly a digital twin provides remote access and more transparency than an actual site visit. Owners can send a digital twin to vendors who can then create models based on its data and reduce the needs for costly visits.

When making capital improvements or deploying a single application across a portfolio of properties, digital twins enable the ability to forecast through modeling the impact in one or many buildings and

drive data decisions that can significantly improve return on investment.

For example, now a simple deployment of conference room sensors or an entirely optimized environment in one property can then be replicated and modeled in other locations within a portfolio for owners to more easily quantify deployment and logistical costs.

In retail, hospitality and industry settings where replicating the same customer experience across all locations is crucial to a brand, digital twins provide a living schematic of how and where to deploy IoT devices and sensors. Imagine the number of IoT devices, cameras and sensors that are used on a single property in another city or a large retail store- having a digital twin can save significant technical labor costs by replicating the same environment while maintaining the customer's experience across all properties. ■

Source: <https://inbuildingtech.com/bms/digital-twin-commercial-office-building/>





# STRATA MANAGEMENT PRACTICE & PROCEDURE – A COMPREHENSIVE EXPLANATION ON THE PROCESSES, FORMS & PRECEDENTS

Lai Chee Hoe, 2019, CLJ Publications, 946 pages  
ISBN 978-967-457-141-2

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Reviewed by:

**TING KIEN HWA**

With the introduction of the Register for Property Managers by BoVAEP and the completion of many more strata properties, the demand for strata management knowledge increase significantly. Other stakeholders such as strata property owners, JMBs, MCs and CoBs etc. require a clear understanding on the laws affecting strata property management. The many Acts and regulations relating to strata management such as Strata Management Act 2013, Strata Titles Act 1985, Strata Management (Maintenance and Management) Regulations 2015 and Strata Management (Compounding of Offences) Regulations 2019 etc. further compounded the difficulties to have a comprehensive understanding and view of the interrelated laws.

Whilst there are other books on strata management in the market, these books<sup>1, 2, 3</sup> are written for the layman and from the perspectives of the developers and consumers/house buyers perspectives. This book serves as a comprehensive reference for anyone who seek to understand the laws relating to strata management particularly the duties, powers and liabilities of the various bodies involved.

The book starts by providing an overview on the applicable law, powers of CoBs, the management by developers before the formation of JMB, establishment of JMB, establishment of a MC and subsidiary MC. This is followed by individual chapters dedicated on issues that often affected many owners and the managing bodies e.g. recovery of charges, inter-floor leakage, enforcement, maintenance account and sinking fund etc. The chapter covering the general duties of a purchaser, parcel owner or a proprietor would help them to understand what are the responsibilities and obligations that they bear. The chapter on managing agent and property manager helps to understand their differences and how they are being appointed. The chapter on conducting general meetings and related issues are most welcome as such events often

bring up issues on who are entitled to attend, voting rights, eligibility for election, the requirements and process convening a general meeting etc. Finally the chapter on Strata Management Tribunal is a much welcome chapter by many readers.

The sample forms for general meeting, the forms and schedules of the Strata Titles Act 1985, Strata Management Act 2013 and its related regulations are also provided which constitute 45% of this thick book.

This book also serves as a quick guide on the practical and procedural aspects of the strata management law. Among the topics covered are recovery process of charges, different rates of charges etc. Procedures such as the convening process for an annual general meeting are translated into charts that aids easy understanding. The standard templates, relevant forms, sample letters, sample tribunal forms etc. are also included in this book for quick and easy reference. The relevant provisions in the respective Acts are neatly summarized in tables to aid easy reference.

In short this is a comprehensive book on strata management which serves as a useful reference for owners, JMBs/MCs and property professionals. A new edition of this book that updates on the recent decided court cases will keep this book a handy reference for property managers, owners and management bodies for many more years to come. ■

#### Note

1. National House Buyers Association (2019) *HBA insight into strata management legislations* ISBN 978-967-17520-0-5
2. REDHA Institute (2018) *Strata Management Handbook* ISBN 978-967-15985-0-4
3. Chris Tan (2015) *Strata OMG: Owner's Manual & Guidebook* ISBN 978-967-10028-5-8



# CAN SEWERAGE CHARGES BY INDAH WATER KONSORTIUM (IWK) BE WAIVED FOR VACANT PREMISES?

## IWK CUSTOMER/USER

**A**s defined in the Sewerage Services (Charges) Regulation 1994, IWK customer or user means the owner or occupier or any person, firm, corporate body or other legal entity who is the owner or occupier of any domestic, commercial, industrial or government premises, as the case may be, provided with connected services or septic tank services and the premises are located within the operational areas of a Local Authority that has been handed over to IWK to provide services and maintenance.

## VACANT PREMISES

A premise which has been vacant for six (6) consecutive months with water consumption up to 1m3 per month is eligible for a waiver of the sewerage charges. However, customer has to provide documentary evidence in the form of a Water Statement of Account during the vacant period and/or deposit payment/last payment receipt from the Water Operators on the termination and/or installation of water supply.

Alternatively, the Statement of Account or documents from Tenaga Nasional Berhad showing nil usage or no power supply during the vacant period may be considered.

## OWNER/TENANT LIABILITY

The occupier i.e. owner or tenant of any premises to which sewerage services has been provided by IWK shall be liable to pay the sewerage charges.

However, if the occupier or tenant of the premises failed to fulfil this obligation, the owner is jointly liable

to pay the sewerage charges, as stipulated in the Sewerage Services Act, Regulations of Charges 11, "the owner and occupier of a premises to which sewerage services has been provided by IWK under these Regulations shall be jointly and severally be liable to pay the sewerage charges, provided the owner of the premise shall, in the absence of any agreement to the contrary, be entitled to recover from the occupier (tenant) of the said premises any such charges paid by the owner/landlord at the time of occupation by the occupier (tenant)".

## CHANGE OF OWNERSHIP

Photocopies of the relevant pages from the Sales & Purchase Agreement with the names of the purchaser/seller, property address, date of agreement and signatories of all parties concerned are to be submitted to IWK for any change of ownership. This is to ensure that ownership details are accurately registered in the premise sewerage account. ■

Source: [www.iwk.com.my](http://www.iwk.com.my)

Owner Address

IWK No 44, Jalan Dungun, Damansara Heights, 50490 Kuala Lumpur, Malaysia.

Selamat Sejahtera Tuan.

(u.p.: Customer Relation Department)

Dimaklumkan rumah saya beralamat No .....  
..... tidak berpenghuni sejak tahun 20xx. No akaun pembentungan adalah .....

Sehubungan itu, dengan ini dipohon pengecualian bayaran caj pembentungan bagi tahun 20..... dan 20..... serta yang berkecualan. Bersama-sama ini dilampirkan dokumen berkaitan untuk rujukan pihak tuan.

Sekian, terima kasih.

email to [care@iwk.com.my](mailto:care@iwk.com.my)

# ASSESSMENT EXEMPTION FOR VACANT PREMISES IN FTKL



## JABATAN KEWANGAN DEWAN BANDARAYA KUALA LUMPUR

### SYARAT-SYARAT PERMOHONAN ELAUN KEKOSONGAN

Pemberian elaun kekosongan hanya boleh dipertimbangkan sekiranya syarat-syarat di bawah Seksyen 162, Akta Kerajaan Tempatan 1976 (Akta 171) seperti di bawah ini dipatuhi.

1. Tuntutan hanya boleh dibuat jika bangunan tersebut kosong dan tidak dapat disewakan lebih dari sebulan.
2. Pemilik hendaklah mengemukakan **PERMOHONAN BERTULIS** mengenai kekosongan tersebut **dalam tempoh 7 hari** bermula dari tempoh kekosongan bangunan.
3. Permohonan perlu disertakan **BUKTI** yang memuaskan bagi perkara-perkara berikut;-
  - a) Bangunan dalam keadaan baik dan selamat diduduki
  - b) Segala usaha telah dijalankan supaya mendapat penyewa
  - c) Sewa yang ditawarkan adalah munasabah
  - d) Bangunan telah kosong semasa tempoh yang dituntut
  - e) Cukai taksiran bagi bangunan tersebut telah dibayar sepenuhnya
4. Bagi tujuan di atas, pemilik perlu mengemukakan keratan iklan dalam surat khabar dan Salinan resit pengiklanan atau surat daripada agen hartanah yang telah dilantik.
5. Jika bangunan sedang dalam pembaikan untuk ianya layak diduduki dan pemilik membuat permohonan, maka Perkara (a), (b) dan (c) tidak perlu dibuktikan.
6. Bangunan untuk dijual tidak layak dipertimbangkan untuk permohonan elaun kekosongan.
7. Pemilik mesti menyatakan tarikh-tarikh kekosongan dan alamat untuk dihubungi.
8. Permohonan hendaklah dibuat bagi setiap penggal jika bangunan masih kosong.
9. Permohonan elaun kekosongan hanya bagi tempoh penggal semasa sahaja, permohonan bagi penggal sebelumnya tidak akan dipertimbangkan.
10. Bagi pegangan kategori rumah kedai, perdagangan dan industri, keluasan minima untuk permohonan elaun kekosongan ialah 1,000 kaki persegi. Sekiranya keluasannya kurang daripada 1,000 kaki persegi pemberian elaun kekosongan tidak layak dipertimbangkan.



DEWAN BANDARAYA KUALA LUMPUR  
 Jabatan Kewangan (Hasil)  
 Jalan Raja Laut  
 50350 Kuala Lumpur  
 No. Tel : 03-26179943/48 No. Fax : 03-26983415  
 Email : elaunkekosongan@dbkl.gov.my

**BORANG PERMOHONAN ELAUN KEKOSONGAN**

Seksyen 162 Akta Kerajaan Tempatan 1976

BAGI TEMPOH : JANUARI – JUN / JULAI – DISEMBER TAHUN \_\_\_\_\_

**MAKLUMAT PEMILIK**

1. Nama Pemilik : \_\_\_\_\_
2. Alamat Harta : \_\_\_\_\_  
 \_\_\_\_\_
3. Alamat Surat Menyurat : \_\_\_\_\_  
 \_\_\_\_\_
4. No. Telefon : (R) \_\_\_\_\_  
 : (B) \_\_\_\_\_ 5. Email : \_\_\_\_\_  
 : (P) \_\_\_\_\_

**MAKLUMAT HARTA**

No. Fail ( Jika ada ) : \_\_\_\_\_

Jenis Harta : Kediaman  Komersial   
 Lain-lain : \_\_\_\_\_ (Sila Nyatakan)

Bil.	No. Akaun Cukai Taksiran	Unit/tingkat yang kosong	Keluasan kaki persegi
1.			
2.			
3.			

Nota: (i) Sekiranya Melebihi 3 akaun, sila sertakan lampiran.  
 (ii) Keluasan minimum 1000 kaki persegi bagi harta komersil (8% & 10%)

Tandatangan : \_\_\_\_\_

Nama Pemohon : \_\_\_\_\_

Tarikh : \_\_\_\_\_

# COUNCIL CONDUCTS CHECK ON STRATA MANAGEMENT ACT COMPLIANCE

Star Metro 29 September 2021



*The MBSJ team examining documents during an audit compliance check at a JMB office*

**S**ubang Jaya City Council (MBSJ), in collaboration with Housing and Local Government Ministry, conducted an audit compliance check on an apartment Joint Management Body (JMB) in Seri Kembangan.

It was carried out to check on compliance with the Strata Management Act 2013 (Act 757) and standard operating procedure (SOP) of the National Recovery Plan.

The operation at the apartments in Serdang Perdana involved some 20 officers from MBSJ's Commissioner of Buildings, MBSJ's Enforcement Department, the

strata management section under Housing and Local Government Ministry's National Housing Department and security officers from the ministry.

"In accordance with the provision of powers under the Act, MBSJ conducted an audit on the residential apartment's financial and management documents," said MBSJ Corporate and Strategic Management Department deputy director Azfarizal Abdul Rashid in a media statement.

Among the documents examined were minutes of the annual general meeting, minutes of committee member meetings, service contracts, service

agreements, bank statements, cheques, collection reports, expenditure and payment reports, financial reports, ledgers, payment vouchers and utility bills.

These were for the period between 2017 and 2021.

“Following this inspection, several documents were taken for further investigations.

“If there is any instance of non-compliance, enforcement action based on powers under the Act will be taken against the JMB, such as fines or

prosecution,” said Azfarizal.

“During the operation, the team also inspected the guardhouse, lift facilities, playground and apartment grounds for SOP compliance, and they were found to be satisfactory,” he said.

He stressed that MBSJ and the ministry would continue to periodically monitor JMBs and management corporations to ensure such bodies complied with the SOP in managing and maintaining their respective properties. ■

A hand holding a black pen is writing the word "Compliance" in a cursive script on a white sheet of paper attached to a clipboard. The clipboard is resting on a dark wooden surface. The hand is wearing a white shirt cuff and a dark suit sleeve.

Compliance

# CURRENT OFFICE BEARERS

## (2021 - 2023)



**President**  
Datuk Sr Haji Kamarulzaman  
bin Mat Salleh



**Deputy President**  
Sr Haji Ishak Bin Ismail



**Secretary General**  
Sr Nageswaran Muniandy



**Committee Member**  
Sr Firdaus Musa



**Committee Member**  
Prof Sr Dr. Ting Kien Hwa



**Committee Member**  
Sr Matthias Loui Hoong Fei



**Committee Member**  
Sr David Looi Siew Fatt



**Committee Member**  
Mohd Razik Mohamed Shakif



**Committee Member**  
Rozaini Bin Nizar

## FIRST EXECUTIVE COMMITTEE MEETING

6th October 2021 | Chilis Grill Bar, Mid-Valley Megamall, Kuala Lumpur



## SECOND EXECUTIVE COMMITTEE MEETING

29th November 2021 | Concorde Hotel, Kuala Lumpur





## MIPFM CPD SEMINAR 'PROACTIVE PROPERTY MANAGER' SECOND SERIES

DATE: 23 DECEMBER 2021

VENUE: CONCORDE HOTEL KUALA LUMPUR,  
JLN SULTAN ISMAIL  
CONCORDE BALLROOM (LOBBY LEVEL)

TIME: 8.30AM - 5.00 PM

SPONSORED BY



## PROGRAMME

8:30 AM - 9:00 AM	REGISTRATION
9:00 AM - 10:30 AM	COB'S PROCUREMENT BY YBHG DATUK SR HAJI KAMARULZAMAN BIN MAT SALLEH
10:30 AM - 10:45 AM	TEA BREAK
10:45 AM - 12:15 PM	PLANNED PREVENTIVE MAINTENANCE (PPM) BY SR HAJI ISHAK ISMAIL
12:15 PM - 12:25 PM	NIPPON PAINT PRODUCT SHARING
12:25 PM - 1:45 PM	LUNCH BREAK
1:45 PM - 3.15 PM	OCCUPATIONAL, SAFETY & HEALTH COMPLIANCE BY SR MATTHIAS LOUI
3:15 PM - 3:30 PM	TEA BREAK
3:30 PM - 5:00 PM	FINANCIAL & CREDIT CONTROL BY SR HAJI ADZMAN SHAH BIN MOHD ARIFFIN
5.00 PM	EVENT END

## SPEAKERS



**Datuk Sr Haji Kamarulzaman Mat Salleh** is an Executive Director (Management) of Kuala Lumpur City Hall (DBKL). He is a Fellow Member of Malaysian Institute of Property and Facility Managers (MIPFM), Royal Institute of Surveyor (RISM) and a Registered Valuer, Estate Agent and Registered Property Managers with the Board of Valuers, Appraisers, Estate Agents and Property Managers (BOVAEP). He obtained his Master in Land Administration & Development and a Bachelor Degree in Surveyor (Property Management) from the University of Teknologi Malaysia (UTM). He also hold a Certification of Mediator at the Bar Council Malaysian Mediation Centre. Datuk Sr Haji Kamarulzaman has more than 30 years of experience in Valuation, Commissioner of Building and Property Management in DBKL. Datuk Sr Haji Kamarulzaman is a President of Malaysian Institute of Property and Facility Managers (MIPFM).



**Sr Haji Ishak bin Ismail** is the Founder and Managing Director of IM Global Property Consultants Sdn Bhd. He has been in real estate practice since 1991. In 2015, he has been accredited as an International Certified Valuation Specialist or Business Valuer by the International Association of Consultants, Valuators and Analysts (IACVA). He obtained his Masters in Business Administration (MBA) from International Islamic University, Malaysia in 2006. He has more than 27 years of experience in consultancy services including valuation, estate agency, project management, auction and property training. He has received an excellent award and the Property Manager of the Year from the BOVAEP. Sr Haji Ishak is also President of Persatuan Perunding Hartanah Muslim Malaysia (PEHAM) and Deputy President of Malaysian Institute of Property and Facility Managers (MIPFM). He is also a Fellow member of the Royal Institute of Surveyors Malaysia (RISM), PEPS, and as well as the Malaysian Institute of Property and Facility Managers (MIPFM).

## SPEAKERS



**Sr Haji Adzman Shah bin Mohd Ariffin** is a Chief Executive Officer/ Chief Real Estate Consultant at ExaStrata Solutions Sdn Bhd. He is also the immediate past president of the MIPFM. Sr Haji Adzman Shah has been involved in the real estate industry for more than 30 years as a property consultant, valuer, estate agent and property manager. He graduated from University of Glamorgan, United Kingdom. He is a registered Valuer, Estate Agent and Property Manager with the Board of Valuers, Appraiser and Estate Agents and Property Managers (BOVAEP) as well as Chartered Surveyor accredited by the Royal Institution of Chartered Surveyors, United Kingdom. He has an extensive experience in property management industry and has started his career in Cardiff, United Kingdom. He is a Fellow members of Royal Institution of Surveyors Malaysia (RISM), Malaysian Institute of Professional Property and Facilities Managers (MIPFM) and the Board members of BOVAEP. Sr Haji Adzman Shah has received an award for Eminent Contribution to the Property Management Industry in Malaysia in 2011, Property Manager of the Year award in 2016 from BOVAEP, Lifetime Achievement Award in 2017 from the Royal Institution of Surveyors Malaysia. He also received the Sultan Sharafuddin Idris Shah (S.I.S) by the HRH Sultan of Selangor in 2018



**Sr Matthias Loui** has more than 35 years experience in real estate, property valuation services, property development and property management in both established professional consultancy companies and large corporations. He is a Director, Property Management at Salvills (KL) Sdn Bhd. His expertise includes marketing, leasing and management of the prime properties in particular high-rise and commercial. Sr Matthias is a Registered Valuer, Property Manager and Estate Agent with the Board of Valuers, Appraisers, Estate Agents and Property Managers Malaysia (BOVAEP). Sr Matthias is a Fellow member of the Royal Institute of Surveyors Malaysia (RISM), PEPS, and as well as the Malaysian Institute of Property and Facility Managers (MIPFM). During his early years of training in professional chartered surveyors firms, Matthias has accumulated many years of hands-on experience in all property related services and in particular property management and has proven to be very invaluable in his present capacity. He has also gained wide exposure during his tenure in prominent property developers' companies and is capable to undertake and provide services which are in line with his client's objectives and aspirations.



# MIPFM CPD SEMINAR “PROACTIVE PROPERTY MANAGER”

30 November 2021 at Concorde Ballroom, Concorde Hotel,  
Jalan Sultan Ismail, Kuala Lumpur

Sponsored by Nippon Paint and is approved by BoVAEP for 5 CPD hours







Photograph courtesy of Ting Kien Hwa

## ⋮ INVITATION FOR ARTICLE CONTRIBUTION ⋮ FOR *THE PROPERTY MANAGER*

*The Property Manager* is a peer review journal published quarterly online by the Malaysian Institute of Property and Facility Managers (MIPFM). The journal aims at bringing together professionals, practitioners, academicians, researchers and students to impart and share knowledge in the form of practice notes, empirical and theoretical articles and research papers. It provides a forum for the dissemination of professional knowledge and practices, original research results, new ideas and practical experience of the property managers and facility managers. Industry notes on the advancements and innovation in proptech are very much look forward to by members. The Editorial Board welcome original article contribution to *The Property Manager*.

### **PEER REVIEW PROCESS**

Manuscripts are subject to review by the Editorial Board and reviewers.

### **GENERAL GUIDELINES FOR SUBMISSIONS**

Article submissions should not exceed 12 A4 pages, including all figures and tables (excluding the references). Abstract should be no more than 500 words. Articles in Bahasa Malaysia need to include an abstract in English.

### **KINDLY EMAIL ARTICLE TO:**

[editor.mipfm@gmail.com](mailto:editor.mipfm@gmail.com)



**Malaysian Institute of Property and Facility Managers (MIPFM)**

RISM Building, 1st floor, Bangunan Juruukur,  
64-66, Jalan 52/4, 46200, Petaling Jaya, Selangor

Mobile : +6019-600 8022

Tel : +603-79601261

Email : [secretariat@mipfm.org.my](mailto:secretariat@mipfm.org.my)

Website : [www.mipfm.org.my](http://www.mipfm.org.my)