

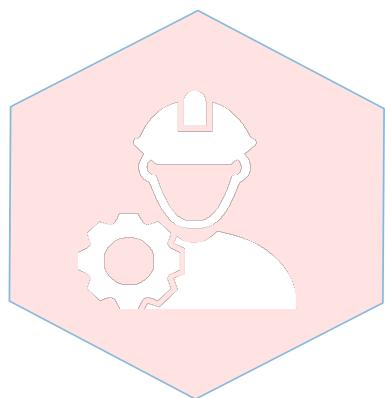


**Due Diligence, Asset Management, and
Data Analytics for Engineering Systems**

Engineering Systems and Construction Sectors

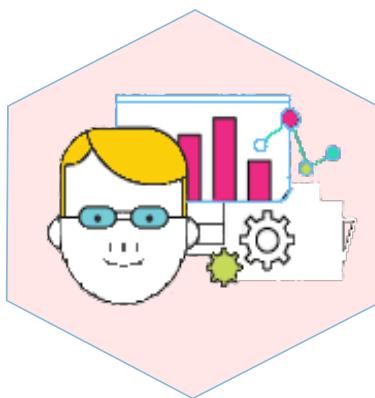
**Due Diligence
Asset Management
Data Analytics
Market Research**

ASQ is a team of senior and licensed Engineers and Data Scientists, established in 2016 as a spin-off from ETH Zurich in Switzerland and Kyoto University. We focus on development and implementation of frameworks, models, and data analytical and reliability engineering approaches toward determination of sustainable solutions and realization maximum benefits for stakeholders and the society.



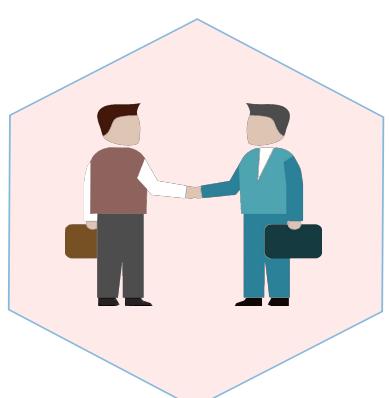
We're Owner Engineers

Senior and licensed engineers in various engineering disciplines are capable of conducting accurate measurement, testing, and evaluation of engineering systems.



We're Data Scientists

We assist Clients in making optimal decisions on operation and management of assets by applying Data Analytics, Statistic Inference Analysis, and Reliability Modelling.



We're Professional

We are attentive and punctual in providing adequate level of services to Clients, working with Clients as One Team using Agile management practice and collaboration.

DUE DILIGENCE

We provide Technical Due Diligence (TDD) services that involve a process of systematic review, analysis, and discovery of the conditions of assets from various viewpoints such as architectural, constructional, structural, MEP, fire safety and external façade checking.

The TDD services also consists of a review and analysis of cost estimation for short, medium, or long-term preventive intervention program. We utilize experience and knowledge of asset management in the context of TDD to provide optimal set of advices regarding future investment on the assets. All identified defects are being assessed as per their seriousness and are being added with a qualified investment costs estimation for their removal. Our company owns a rich set of cost database on investment projects both locally and globally, thus we will be able to provide Clients accurate cost estimation for TDD services through a rigorous benchmarking process.

TDD can also cover a building review from legal point of view (building conformity with valid construction standards). This is being provided by creating a summary and analyses of the most important issued permits including identification of possible neglects or related risks. Our services may also include assessment of environmental risks, environmental due diligence.

This is being provided by commenting the project in terms of possible site contamination risks and environmental impacts assessed on the basis of available documentation.



M&A for commercial and office buildings



M&A for properties under construction



M&A for properties of industrial sites



Infrastructure systems

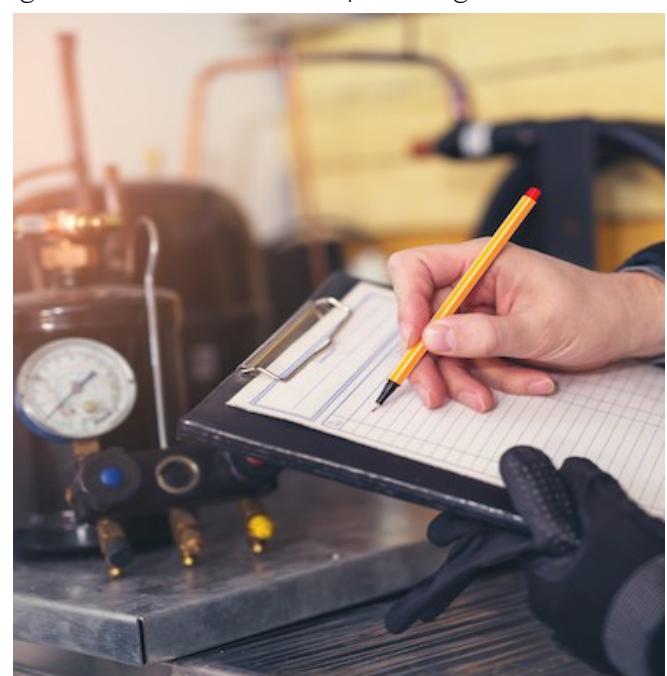
DUE DILIGENCE

Technical audit can further control actual measurements of lease or other areas and revise related contracts and guarantees. Technical audit/ feasibility study can be also conducted during the Project preparation phase based on the evaluation of Project documentation and other available documents.

Benefits

The benefits of having us to provide TDD services to you includes, but not limited, to the followings:

- Gaining a good perception on the physical condition states of the assets and the overall deficiencies compared to the intended design.
- Establishing a set of Level of Services that assets are required to provide adequately for their intended use.
- Estimating a high-level Cost Estimate for a Preventive Intervention Program.
- Providing a level of security and protection for investors regarding acquisition or investment on assets.
- Providing a certain level of confident on asset pricing for allocation of risk or price negotiations.



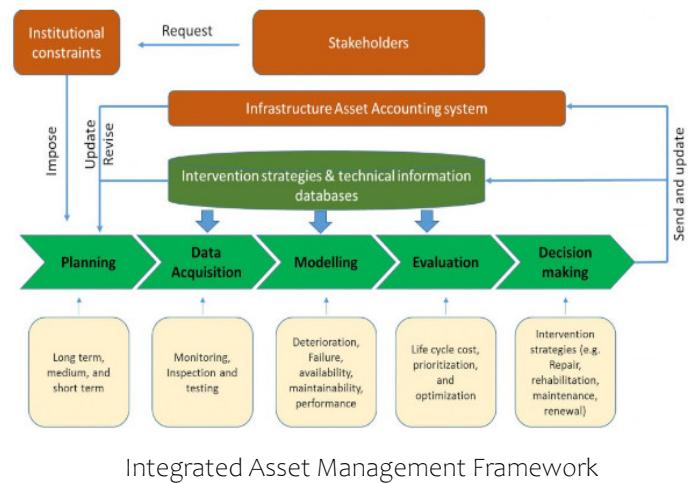
We have combined the science of asset management and real estate business into the practices of Technical Due Diligence works that supports Clients to have long-term and visionary views on capital investment's prospective and sustainable benefits. We create value-added benefits to Clients by utilizing in-house rich cost database and in-depth analysis using appropriate benchmarks.

ASSET MANAGEMENT

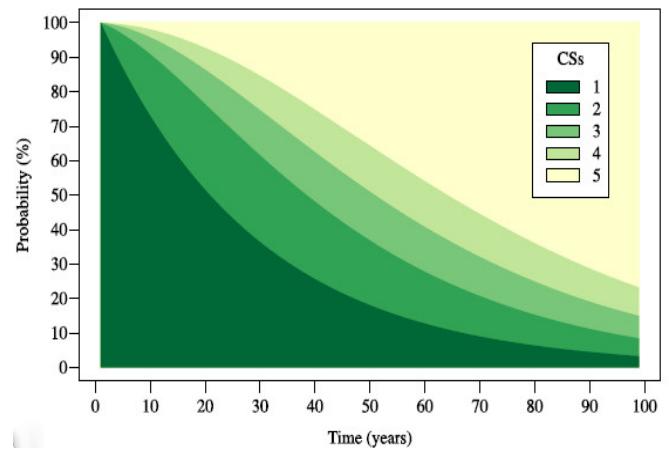
Asset Management is the optimal allocation of the scarce budget between the new arrangement of asset and rehabilitation/maintenance of the existing assets to maximize the value of the stock of assets and to realize the maximum outcomes for the stakeholders.

Our services encompasses

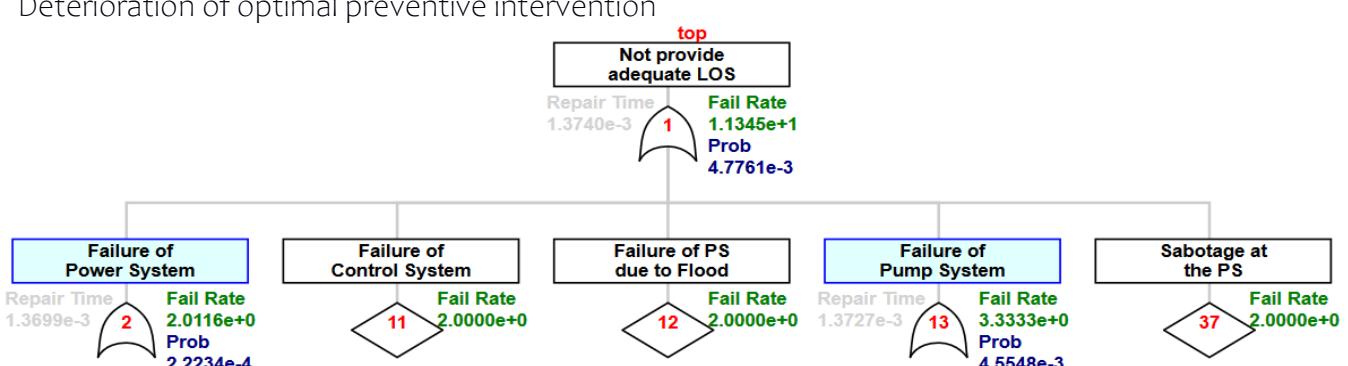
- Asset inspection and monitoring for capturing physical condition and operational condition of assets.
- Development of asset hierarchy and classification.
- Preparation of blue-print and strategic framework for organizations aiming to establish a long-term integrated asset management.
- Reliability study and modelling based on both qualitative and quantitative approaches.
- Weibull and Markov modelling and analysis.
- Fault-Tree, Event-Tree, Bowtie, and Reliability Block Diagram (RBD) analysis.
- Deterioration prediction and modelling based on historical, inspection and monitoring data.
- Life cycle cost estimation and calculation of Return on Investment.
- Deterioration of optimal preventive intervention



Integrated Asset Management Framework

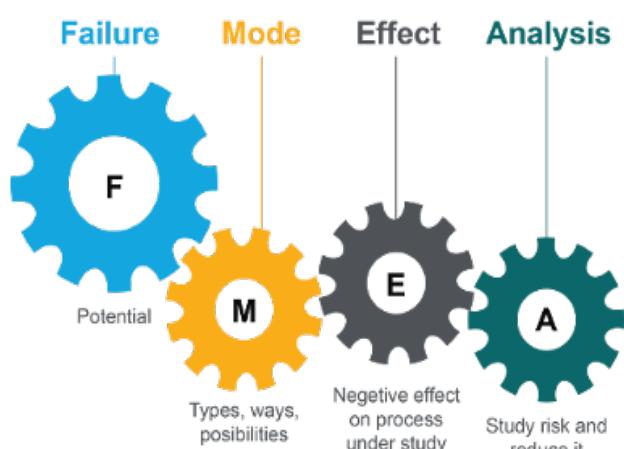


Deterioration and Reliability Modelling



Fault Tree and Event Tree Analysis

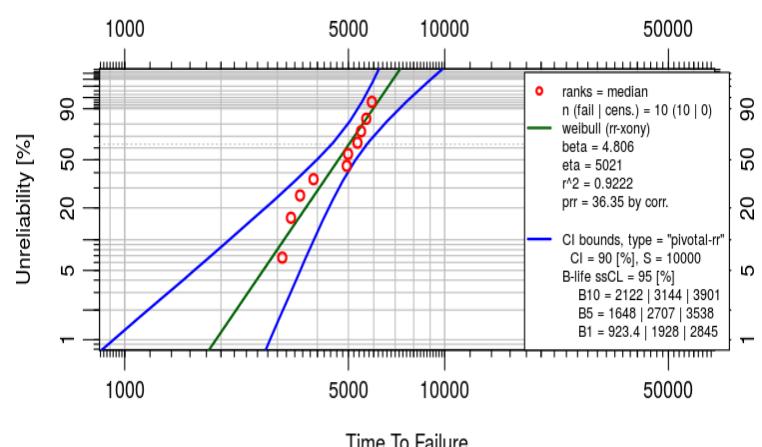
ASSET MANAGEMENT



We are capable of providing asset management services for various types of engineering and infrastructure systems such as water and wastewater utilities, mechanical and electrical assets of industrial plants, bridge and pavement systems, and building assets.

We are fully committed to apply the state-of-the-art asset management standards (e.g. FMEA, ISO55000/01/02) to realize the best and optimal solutions for keeping and maintaining your assets in good conditions and constantly provide adequate level of services.

Modern asset management for engineering systems shares similar concepts and modelling approaches of financial engineering. Thus, it is important for asset management engineers and specialists to comprehend the underlying models led to deterioration based on statistical and probabilistic approaches and models of life cycle costing for determination of optimal preventive intervention strategies.

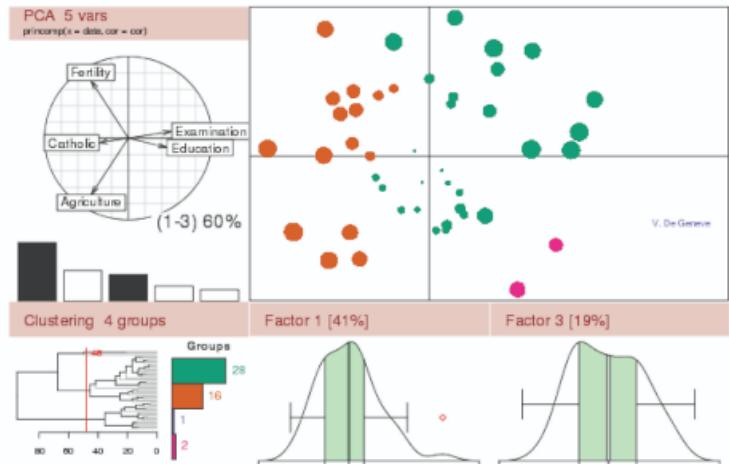


DATA ANALYTICS & MODELLING

Time series and panel data of operations and condition states of engineering systems, if being recorded properly, can be extremely useful to be used in data analytics and AI modelling to predict trends and provide further insightful pictures on

- Efficiency
- Reliability and stability
- Correlation of variables
- Bottlenecks
- Risk factors and impacts

By understanding those, optimal decisions can be made. The tasks on data solutions and AI can also be linked to Asset Management using the power of statistical correlation and prediction capacity, which could potentially save significant cost.



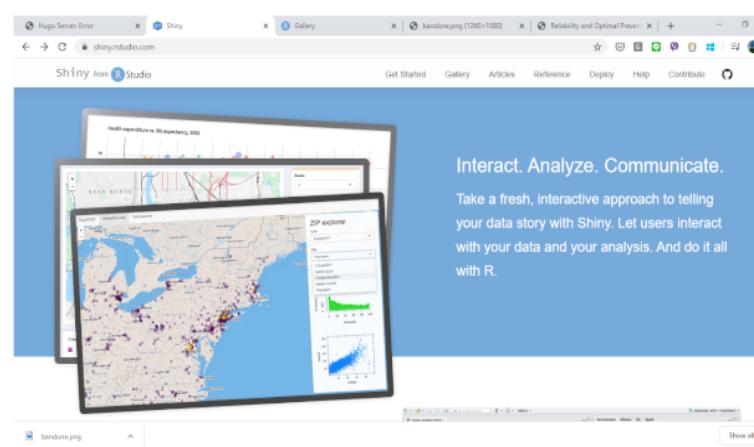
Open source approach

We extensively use open source analytical software such as Python and R. This means we can transfer the codes to Clients for knowledge sharing and learning. This is an important approach that supports Clients to gradually master the methodologies for future implementation and expansion.



Interactive Reporting

We develop various types of interactive reports and dashboard that can be shared online conveniently. Latest platforms such as R Shiny, Power BI, and Tableau can be deployed based on the specific Clients requirements and expectations.



MARKET ANALYSIS FOR CONSTRUCTION SECTORS

Strategic Growth Consulting

Capital Investment Analysis

Opportunity Screening and Analysis

Market Entry Analysis

Target Screening

Customer Experience



We combine market analysis techniques with knowledge and experience in econometrics, operations research, statistics, and engineering to provide an advantageous approach toward determination of optimal capital investment strategies on acquisition of existing properties or development of new properties taking into consideration of local settings and global trends.

Our rich historical database on cost and price of assets, materials, and labor in construction and infrastructure sectors enables to perform various types of quantitative analysis, comparative study, and econometrical modelling to capture the equilibrium of price and market behaviors as well as influencing factors on specific properties.



MARKET ANALYSIS FOR CONSTRUCTION SECTORS

Construction and infrastructure industry in ASEAN represent attractive opportunities for OEMs, material suppliers and component suppliers.

Critical to success is knowledge of market trends, product mix shifts, customer requirements and effective market strategies.

ASQ's continuous networking with local and global Clients, Suppliers and Competitors creates complete visibility across the whole value chain of the construction sector and therefore we can effectively support our valuable Clients in making optimal decisions.

APPROACHES

Qualitative Analysis

Formulation of questionnaire for online and offline surveys

Interviewing with focused individual and groups

Desktop study and observation

Data collection

Discussion and workshopping

Quantitative Analysis

Regional Analysis (e.g. supply and demand analysis, Computational General Equilibrium models, Input/Output Models)

Statistical Correlation and Inference

Economic Dispatch Modelling (e.g. for power stations and Water utilities investment)

Forecasting with statistical and probabilistic models for trends

Data Envelopment Analysis (DEA)

Stochastic Frontier Analysis (SFA)



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