

ARCHITECTURE, DIGITAL TECHNIQUES & PROJECT MANAGEMENT

The Experience of Gulf House Engineering (GHE)

SOUHEIL EL-MASRI, MAZEN KANA'AN AND MOHAMMED FAWZI ELANANY

Email address: ad@ghe.com.bh

Email address: ads8@ghe.com.bh

Email address: ads6@ghe.com.bh

Gulf House Engineering – Kingdom of Bahrain

Abstract. With the invention of computers, Architecture and other Engineering disciplines have undergone revolutionary developments offering new opportunities for improving efficiency and opening new frontiers for creativity. For example in architecture and urban planning, the discussions have been extended from conventional writings to cover cyberspace, virtual architecture and digital city. Moreover, computers have helped in the realization of many complex projects that would be inconceivable with traditional drawing techniques. This is clearly demonstrated in the works of Frank Gehry's, Zaha Hadid, Daniel Libeskind and many others. In deed, digital techniques have changed the design creative process and how the architects think. Traditionally the structured development architectural ideas from 2D drawings (plans, sections, elevations) towards 3D resolution has been replaced by more interactive approach of 2D & 3D. The changes that digital techniques have brought to the field of Architecture; including practice and education, can obviously be viewed from different angles and incite many discussions and questions. However, the purpose of this presentation is to discuss the role of digital techniques within the overall framework of project management in Gulf Housing Engineering. It starts the discussion with a brief on architecture and digital techniques in the Gulf Region, especially during the “boom period”; a period characterized by rapid production of buildings relying heavily on virtual images. It is against this background, the role of digital techniques is evaluated from a practice point of view. In fact in GHE, digital means are integral parts of the holistic project delivery process starting form initiation, to

various design stages to construction ending with project completion. In this process emphasis is paid to the inter-relationships between IT Systems and Quality Control which in turn facilitate measuring, monitoring and reporting on various managerial, technical and design and budgetary aspects of the project. The presentation is supported by real case studies of GHE portfolio. It emphasizes that digital techniques should be an integral part of an overall process and should be seen as means to enhance efficiency and creativity; and should contribute to the betterment of the built environment

1. Architecture in the Age of Hyper-Production

In the Gulf region, the accelerated wave of developments is project-driven and has snowballed by means of a number of high profile, iconic buildings and building projects. In addition, these signature-developments are or to be designed by the world's most leading architects in order to infuse symbols of uniqueness. From the Palm to the World; to the Tallest Building to the Cloud; and from the Twisted, the Up-side, the Rotated to the Dancing Towers, the approach emphasizes on iconism and visibility. The massive architectural production has been encouraged by increase in oil prices; search for feasible investments after the 9/11; availability of infinite supply of cheap labour, mainly from Asia; ability to provide an atmosphere of political stability and security; and ability to introduce sophisticated financial and managerial mechanisms (Kirchner & Rab, 2007: 18-22). The Gulf has become an international architectural lab for projects never experienced before in terms of scale, idea and complexity. Architecture in the age of "hyper-production" is characterized by several trends/fashions. In many of the projects, the Star / International Architect is a pre-requisite to produce eye-catching buildings and to promote the idea of uniqueness, iconic and landmark. This is something been repeatedly refer to as "wow factor". Complementing this phenomenon is the growing field for marketing and branding of the projects; attractive brochures booklets and CDs, containing carefully phrased slogans and glossy highly rendered images, are widely used for promotion and marketing especially in the ever-increasing number of property exhibitions in the Gulf. It is known that demands for 3Ds rendered images, physical models, and printing publicity material escalate for about three month before property exhibition. However, this image driven approach has led Ivy, R. (2009) to question: What has happened to drawing?

The range of techniques and the craft present in the sheets of handwork remind us what we have lost in our transition to the electronic. The analogy lies in the piano's transition to the electronic keyboard, where technical

ability has thrived but dynamics has disappeared along the way. Rather than the subtle variations in tone, or the slight tremolo and the staccato attack, the nuance that lies in variation of technique, pianists found little but loud and soft in the new technology, resulting in the tonal equivalent of hitting the same key, forcefully, over and over – banging, rather than playing

This age of massive architectural production is also dominated by another phenomenon of rapid project preparation and implementation. Millions of square meters need to be planned and designed in the course of few months. Usually, two to three alternatives to be prepared and than one solution is to be selected. The massiveness of the project is reflected in a complex project organizational structure with an army of different groups: client, project manager, main consultant, sub consultant(s), quantity surveyor, expert(s), etc. While attention is to the development of the project concept, architect is expected to attend to client request for alternatives and/or variations, and to keep up with the various types of meetings: progress, coordination, client meetings in addition to various workshops and in between to respond to the clarifications and reviews. It is in such atmosphere in which project in the age of hyper-production are conceived, developed, coordinated and executed. Projects have increased in scale and complexity, but their time frames have been compressed to catch market opportunities and launching and exhibitions schedules. However, the recent economic crisis (late 2008) has affected the implementation of many iconic projects in the Gulf including Bahrain. Canceling and resizing, and phasing and re-evaluating are the common trends nowadays.



Figure 1. Computer generated forms

Noticeably, this boom has led to rising attention to tradition, heritage and culture; project to be inspired or guided by tradition, or dialoguing with or translation of tradition are frequently appearing in many project briefs. The importance of traditional architectural has been recognized in the Gulf to create buildings and spaces founded on cultural heritage of Arabia. The opportunity exists; is it however going to be an exploration of heritage DNA or simply scanning of few books and postcard? The role of architect/planner is in question and the knowledge of the cultural context is imperative. Tradition is surely in “fashion”; however it is important that the issue of identity to be discussed not as a stylistic matter, but in relation to socio-cultural, economic and environmental realities to ensure urban sustainability in the age of globalization.

It is against this brief background that Gulf House Engineering operates and competes aiming to deliver quality projects and to react to market opportunities.

2. Gulf House Engineering (GHE): Profile



Since its establishment 1990, GHE has fast become the most successful and fast growing firm in the Kingdom of Bahrain. The leap from a small architectural practice to a large Architectural & Engineering Firm is the result of the hard work of a multi disciplinary, qualified and talented team, and also of the visionary leadership of the Head Architect and Managing Director, Ahmed Bucheery and his dedication above all to Quality.

Figure 2. GHE headquarters

Quality is manifested throughout the project process from translation of client aspirations and requirements and ensuring confidentiality, to project documentations and updates, to clear and comprehensive project management programme, to efficient and state of the art in design and

planning schemes. This quality issue is built on deep understanding not only planning & statutory regulations but also on familiarity with the urban developments and market forces especially with reference to Bahrain. Commitment to high quality services and projects guarantees GHE an excellent reputation locally and regionally that attracts more clients daily. GHE Projects covers a wide geographical area including: the Kingdom of Bahrain; the neighbouring Kingdom of Saudi Arabia, the United Arab Emirates, Sultanate of Oman; in addition to Jordan, Egypt Morocco, France and the United Kingdom attesting the rising talent and diligence of this high quality practice. GHE's dedication to quality has secured the firm over four Billion Dinars of projects which vary in location, scope and scale. Its reputation is based not only on its architectural excellence especially in the interpretation and use of traditional architecture principles and languages. It is also founded on the comprehensive project approach from inception to construction including clear understanding and interpretation of contractual matters being financial, regulations, obligations and standards. Indeed the extensive and diverse projects portfolio has enable GHE to build a wide ranging expertise into local resources, rates, law and obligations as well as into regional and international criteria and standards. In addition to Bahrain main office, Gulf House Engineering has two subsidiary companies: Ewan Architectural Engineering Consultancy – Abu Dhabi, U.A.E., opened in 2003, and Gemini Software Solutions Pvt. Ltd. – India, which opened in 1998. Gulf House Engineering is a team of architects, engineers, project managers and administrative staff. Total number of permanent employees exceeds 250 persons including the separate on site team of the Presidential Palace – Abu Dhabi. Also GHE's work is complemented, in some cases, by collaborations with some of the world leaders in design and construction such as: SOM, Office of Metropolitan Architecture (OMA), Scott Wilson, Cracknell, Hyder, WSP, & MBLD are companies with whom we are regularly cooperating on various large scale projects.

3. GHE Project Management & IT System

GHE Project Management System is intrinsically linked to Quality Assurance Control System, which in turn is facilitated / supported by the efficient use of IT system. This includes but not limited to the proficiency in operating computer software and in using various techniques of representation at the different stages of projects from conceptual to Detail design.

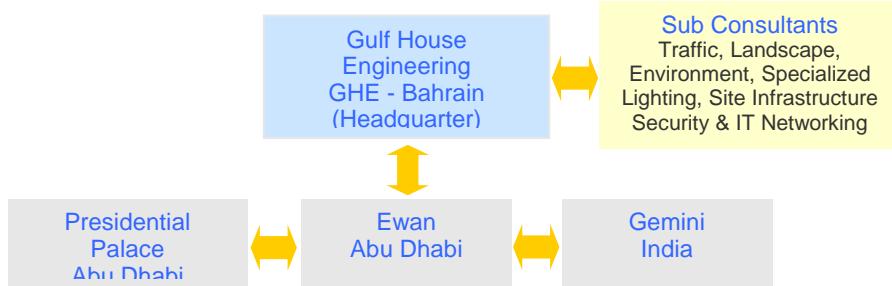


Figure 3. The partners of Gulf house

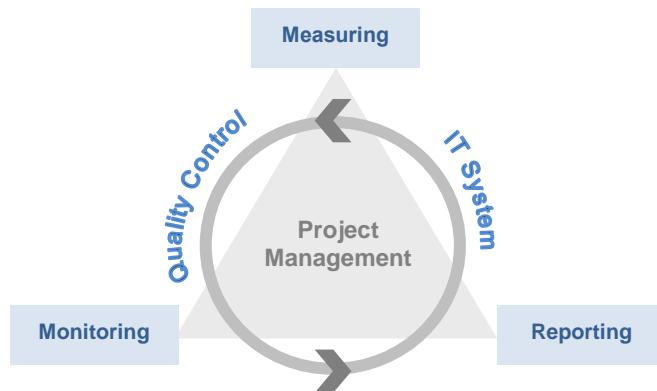


Figure 4. The IT role in managing projects

The project Management System focuses basically on: 1) Comprehensive Project Programming; 2) Holistic design approach in which the various components and requirements - such as infrastructure, traffic, landscape, site conditions, planning and design data - are coordinated at an early stage of the project; and 3) Periodic internal reviews and discussions as well as meetings and interim workshops with sub-consultants and clients. The overall framework of a project database is summarized below in table 1.

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TABLE 1. *The IT role in managing the project processes and information*

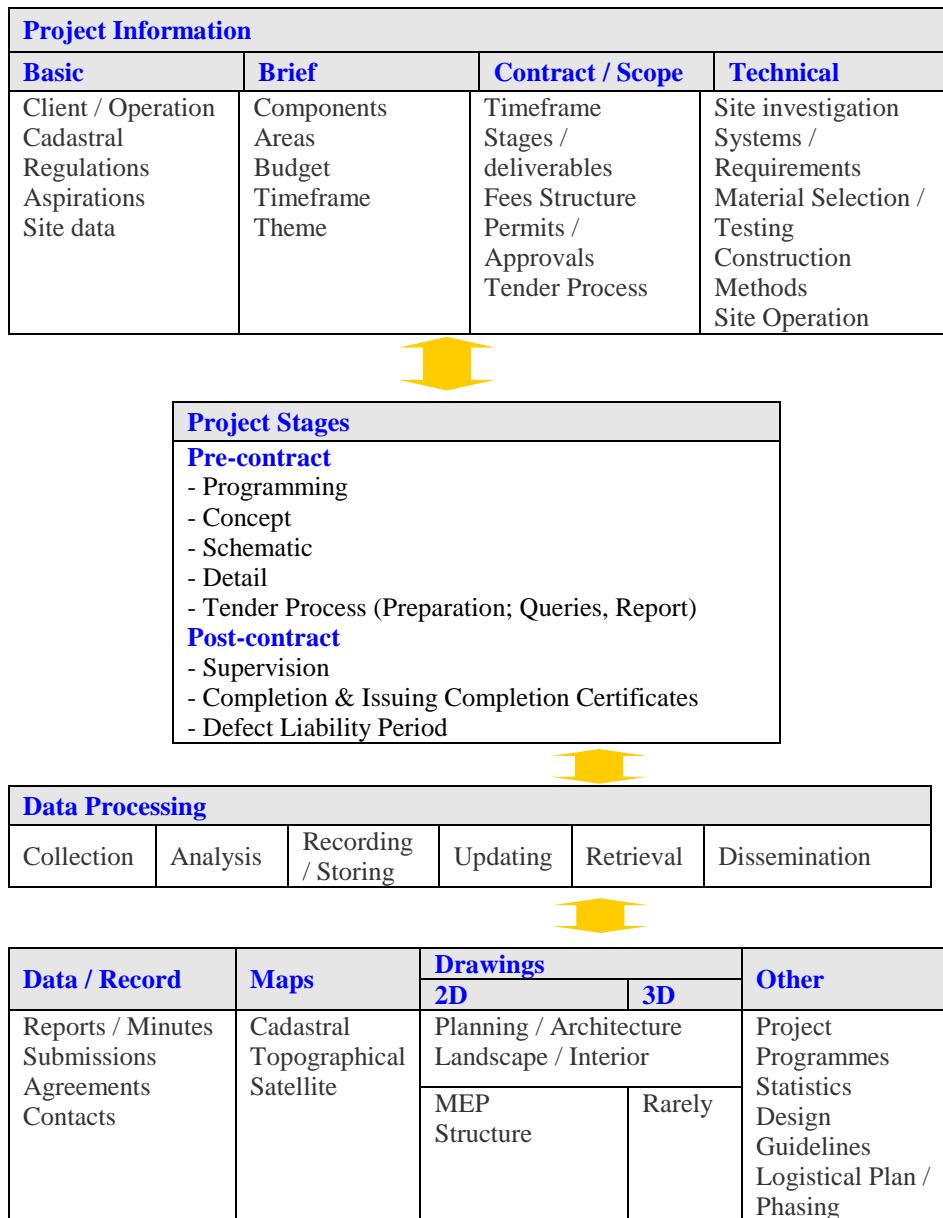


TABLE 2. *The IT infrastructure*

Web- Based: ACONEX for Large project	Servers: 2 x File Servers 1 x Backup Servers 1 x FTP Server 3 x E-mail Servers 2 x SAN Storage 2 x Tape Auto Loaders
Computers: 12 x Note book PC's 77 x Desktop PC's 12 x Workstations	Software: Architecture: ArchiCAD; AutoCAD; Sketchup; Photoshop; 3D Studio Max Mechanical: McQuayTools, Psychometric Analyzer, Duct Sizer, Pipe Sizer/ Flow Electrical: DIALux; Relux; Ecodial; Ducab Structure: ETABS; STAAD; ORION Management: MS Projects; Microsoft Office Suite

In supporting above project Management System, GHE replies on a fully integrated IT system utilizing advanced computers and sophisticated current software to respond to the most stringent guidelines in presenting progress reports and contract documents, design and detailed construction drawings. The technical proficiency is coupled with best procedures, policies and operations adhering to the industry standards and guidelines as well as to periodic maintenances and documents updating and storing. The following is an overview of IT resources available. By using various digital techniques of communication, documents including reports, minutes, drawings, etc. are prepared, reviewed, shared, updated and communicated. As originator of design, architects evaluate the spatial and massing aspects of their projects, and communicate different information to other disciplines involved, clients, authorities, and to collaborators. Different stages of projects require different levels of representation, from conceptual to final construction documents.

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