Introduction of Glodon & Digital Construction Building

Stock Code: 002410
James Liu

1998-1999 Chongqing Branch GM
2000-2006 Cost BU GM
2007-2008 HR GM & Infrastructure Management GM
2009-2014 VP of Glodon Group
2015 SVP of Glodon Group
2017 Director of Glodon Group
2013 Vice Chairman of Construction Market & Tendering Research Center at China Civil Engineering Society
2015 Secretary-General at Green Development Alliance of ZPark Smart Building Association
2016 Membership of Research and Development International
2017 Expert in Big Data Industry Ecological Alliance of China
Helen Liu

Vice President

1999-2000 Technical Engineer
2000-2001 Sales Engineer
2002 Hebei Branch GM
2003 Beijing Branch BD Manager
2004 HQ Promotion Division GM
2005 HQ Sales & Service Management Division GM
2006 Beijing Branch GM
2007 Regional GM (North District, China)
2008-2009 Domestic Marketing GM (Sales & Marketing & Service Division)
2010-2013 VP of Glodon Group & Domestic Marketing GM
2014-Now VP of Glodon Group & MD of International Business Unit
A platform service provider for digital buildings

We are committed to using technology to make every project a success
Our Mission

Pursue the spirit happiness and material happiness for our staff, and to create a better working and living environment for human beings.
Our Vision

Become an outstanding enterprise with happy staffs, industry leaders, evergreen businesses and good reputation
Core Values

- Customer-oriented
- Hard-working
- Entrepreneurship
- Win-win
Glodon was founded and registered in Haidian District as a high-tech enterprise.

Glodon was awarded the title of “Key Software Enterprise under State Planning”.

- Glodon established a research center in the U.S. and became the first Chinese high-tech enterprise in the University of Maryland - China Research Park.
- Glodon listed on the Shenzhen SME board successfully.
- Glodon completed strategic restructuring with Beijing MorrowSoft Technology Company.
- Glodon established a subsidiary in Singapore.
- Glodon completed strategic restructuring with Shanghai Shinedeliver Software Company.
- Glodon established a wholly-owned subsidiary in Hong Kong and extended its market to Taiwan, Malaysia, Indonesia, Thailand and many other Southeast Asian countries.

- Glodon announced its acquisition of Progman Oy, a world-class MEP design and construction software company based in Finland.
- Glodon announced its acquisition of Hangzhou Qingzhou Software Co., Ltd.
- Glodon announced a comprehensive transformation to an Internet plus platform service provider in the construction engineering area.
- Glodon formally published the Digital Construction White Paper, to interpret the concept of “digital construction” systematically, introduce a new concept and develop a path to the transformation and upgrading of construction industry.

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Business

**Cost**

Pricing and quantity calculation: more than 20 core products, over 180,000 enterprise users and over 1 million direct users. Users cover more than 98% special Grade I construction enterprises.

Engineering information service: covering 30 provinces, municipalities directly under the Central Government and autonomous regions, 460 secondary prefectural-level cities and 938 tertiary cities, districts and counties nationwide and possessing nearly 10 years of industrial data.

E-government: applying to nearly 20 provinces, 3 municipalities directly under the Central Government, more than 60 prefectural-level cities and over 100 cooperation projects.

**Construction**

Engineering construction series systems (software + hardware): Integrating three solutions including smart construction site, BIM construction and digital enterprise, providing customers with more than 20 core products, and serving over 1 million direct users.

BIM5D Product: in 2017, the operating income exceeded 100 billion, more than 1000 corporate customers were attracted, over 130 application benchmarks were achieved, and the application rate reached 66%.

**Innovation**

Integration of planning, construction and management: offering services to such projects as Beijing’s Urban Sub-center, Future Science City and Huairou Science City; having close contact with Xiong’an New Area, Fuzhou Coast New Town and Digital China Conference.

Construction unit integration: providing constructors with integrated solutions for their projects’ entire lifecycle by means of BIM.

Interior decoration integration: satisfying end consumers’ demands for personalized customization and achieving mass customized interior decoration for industrial projects by using BIM technologies.

**Eco**

New finance: including 6 financial companies engaging in factoring, finance lease, petty loan and financial service, etc. The accumulative loan offered by the end of 2017 exceeded RMB 800 million.

Engineering education: cooperating with more than 1,400 specialized Institutions of construction and involving nearly 20,000 teachers of construction specialty and over 200,000 students.

Strategic investment and M&A: completing several acquisitions; investing in several companies such as Lakala; taking part in setting up more than 10 funds as a LP and making strategic investment.
Talent System

- Glodon possesses more than 5,200 employees, forming a team familiar with construction, proficient in IT, good at management and capable of assuming responsibilities.

Strategies for talent development:
- Specialization: The employees with higher education background account for 90%, including nearly 200 technical experts specializing in cloud computation and big data as well as more than 200 elites from such industries as graphics and BIM;
- Professionalism: Drawn by job qualifications, career paths for employees are built;
- Globalization: Relying on technical exchanges with such well-known colleges and universities as Stanford University, Carnegie Mellon University and University of Maryland, Glodon improves professionals’ competence continuously.

10+ years of industrial experience

>66%
Talents of construction account for 31%
Talents of computer account for 35%

Sustained Growth
R&D team members total 2,000, with the YoY growth of 18.45%

Younger Employees
Employees under 30 years old account for 70%
Professionalized Development

• As a high-tech enterprise recognized by the state, Glodon pays high attention to independent research and development as well as technical system building. Persisting in R&D investment in such key technical sectors as BIM, graphics modeling, cloud computation, big data, IoT and AI, Glodon has invested RMB 659 million in R&D in 2017. The total R&D investment in the past three years added up to about 2 billion and remained a high year-on-year growth.

• Since the main products of Glodon have proprietary intellectual property rights and self-innovative software architecture, the Company masters 623 software copyrights, more than 40 patents and over 30 core technologies.

• With world-leading 3D graphics algorithm and advanced component technologies, Glodon achieved rapid development and sustainable upgrading of products.

BIM Technologies

Domestic and foreign talents were attracted, while BIM solutions targeting the entire lifecycle of projects were established and applied to several large projects successfully.

3D Graphics Technologies

The graphics technical platform with proprietary intellectual property rights was developed independently and covered such key technical sectors as model data management, geometric modeling algorithm and graphics display rendering, while the WEB big model display reached the domestic leading and international advanced level.

Cloud Computation

Three-layer technical system covering IAAS, PAAS and SAAS was established, including hybrid cloud infrastructure, ITIL operation, maintenance and management system, basic cloud services, BIMFACE open platform, and offered effective support to the transformation of the company's products towards "cloud + terminal".

7 R&D Institutions

Tsinghua University – Glodon BIM Joint Research Center, Shanghai Jiao Tong University BIM Research Center, Shanghai R&D Center, Beijing R&D Center, Xi'an R&D Center, Silicon Valley R&D Center, Finland R&D Center

Layout of Research Institutes & Engineering Academies

Mobile technologies, IoT, big data, BI, AI... ...
Globalized Layout

- Since 2008, Glodon has established its international presence and served customers from more than 100 countries all over the world;
- With its subsidiaries in the USA, Finland, UK and Sweden as cores, Glodon radiates its business out to the European and American markets;
- Driven by the regional advantages of its subsidiaries in Singapore, Hong Kong and Malaysia, Glodon develops the SEA market (including Taiwan, Indonesia and Thailand) and Indian market;
- At present, Cubicost series technical products (TAS, TRB, TBQ, TME and E-tender) and MagiCAD series design products have took their places in the front ranks of the world for their BIM technologies, favored and recognized by global users.

SEA Agent: [The only official mall: http://shop.glodon.com]
Partial Partners

(Note: partial list, in no particular order)

- Tsinghua University
- Peking University
- Tongji University
- Tianjin University
- Carnegie Mellon University
- Stanford University
- University of Maryland
- National University of Singapore
- China Real Estate Chamber of Commerce
- China Association of Construction Enterprise Management
- China Construction Industry Association
- China Civil Engineering Society
- Construction Market and Tendering & Bidding Research Branch
- China Engineering Cost Association
- China Tendering & Bidding Association
- China Construction Metal Structure Association
- China Engineering & Consulting Association
- China Building Decoration Association
- Big Data Industry Alliance of China
- China Software Industry Association
- Dalian Wanda Group Co., Ltd.
- China Vanke Co., Ltd.
- Evergrande Real Estate Group Limited
- Greenland Holdings Corp., Ltd.
- Country Garden Holdings Company Limited
- Beijing Urban Construction Group Co., Ltd.
- Hunan Construction Engineering Group
- China State Construction Engineering Corporation
- China Railway Group Limited
- Shanghai Construction Group
- Beijing Uni.-Construction Group Co., Ltd.
- China Architecture Design & Research Group
- Shanghai Design & Research Institute
- Beijing Municipal Engineering Design Institute
- China Institute of Architectural Design China
- Petrochemical Consulting Company
- Autodesk Limited
- Schneider Electrically-Controlled Equipment Limited
- Royal Institution of Chartered Surveyor
- Building and Construction Authority, Singapore
- ...
Beijing's Urban Sub-center in Tongzhou District

Beijing Subway

CTF Finance Centre, Shanghai World Expo Exhibition & Convention Center

Tianjin Goldin Finance 117

Shenzhenwan International Commercial Center of China

Yueyang Dongting Lake Bridge

Hainan Middle Route Expressway

Sanmen Nuclear Power Station

Kunming Railway Station

Gezhouba Water Control Project
Dreams of the First Undertaking

We have achieved our dream when we start an undertaking enabling estimators to throw away calculators.

We have also become the No. 1 construction cost software in China.
The Digital Age -- Symbiotic Development of “Three Worlds”

Optimization and Innovation

Unconscious World

Digital Modeling

Competence Improvement

Digital World

Digital Drive

Feedback Evolution

Physical World

Information Perception

Mutual promotion, common evolution and symbiotic development of "three worlds" improve people's ability to learn and change the world dramatically, lower the cost significantly and further promote people's efficiency and progress of transforming the physical world.
The business logic of the digital age has changed

Every enterprise faces

- To develop into an industrial platform by horizontal integration of a value chain
- To create an irreplaceable professional competence by longitudinal development towards a segment

Big data, cloud computation, mobile technologies, networking, AI, social intercourse, IoT and BIM
The construction industry calls for transformation and upgrading

**Drawn by consumption upgrade**
- People spend 92% of their time living and working in construction area.
- With social development and advancement of science and technology, people’s consumption structure, consumption quality and consumption logic are upgrading, so are their demand for construction.
- Construction not only satisfies the basic demand for use, but pursues the quality of living and using. It changes from a standard house to a customized and personalized one.
- The demand for move-in conditions is increasing.

**Boosted by environmental requirements**
- The energy consumption of construction accounts for 50% of the total energy consumption in the world.
- The pollution arising out of construction activities accounts for about 40% of the total pollution in China, and the carbon discharged by the construction industry account for 50% of the total in China.
- The energy consumption of construction operation accounts for 47% of the social energy consumption in China, and more than 95% of the existing buildings are buildings with high consumption of energy.
- According to the Government Work Report released on March 5, 2016, the water consumption, energy consumption and CO₂ discharge of each unit in gross domestic product should be lowered by 23%, 15% and 18% respectively in the next five years.

**Driven by technical reform**
- The mature consumption Internet and thriving industrial Internet create a favorable environment for industrial development.
- The development and maturation of BIM + cloud, big data, IoT, mobile technologies and intelligence are driven by technical development.
- Digital technologies are permeating and affecting the industry and social life at every level and a new industrial ecosystem is developing.

**Forced by industrial development**
- The total profit rate of the construction industry is 1%-3% only, which is far lower than that of the other industries.
- The investment in research and development is woefully inadequate, which is less than 1%.
- Only 9.8% of the migrant workers of the new generation are engaged in construction, representing one third of the migrant workers of the last generation.
- On February 21, 2017, the State Council has printed and released Opinions about Promoting Sustainable and Healthy Development of the Construction Industry.

It is the general trend for the construction industry to transform and upgrade.
Inspiration from the digital reform of the manufacturing industry

Digital Production

Red Collar Group
- Rapid collection of data about customers' diffused and personalized demands
- Removal of intermediate circulation and achievement of lower transaction cost
- Zero stock, low investment and high return
- Increase in customer stickiness

Digital Rocket

Long March 7
- No paper drawings is required during the entire R&D procedure
- Design is changed from "comic" to "3D film"
- The production and processing stage is accomplished by "one touch"
- Experiment and assembly are done at one time

Digital Plane

Boeing 777
- The development period is reduced from 9 years to 4.5 years
- The cost is lowered by 25%
- Digital design applies to the 100% overall unit
- The engineering changes are lessened by 90%

- Mass customized production became possible
- The manufacturing approach changed from physical production to integration of real and virtual production
- Production-based manufacture is transformed into service-based manufacture
- Centralized production is changed into Internet-based collaborative production.
Dreams of the Second Undertaking

To make every engineering project succeed

To become

A global leading digital construction platform service provider

Every engineering project should be connected with water, electricity and Glodon!

Digital construction platform
One Objective: To make every engineering project succeed

**Standard**

- The cost is lowered by 1/3
- The process is quickened by 50%
- The carbon dioxide discharge is lowered by 50%
- 0 Quality defect
- 0 Safety accident

*For the success metrics of projects, refer to the strategies and requirements proposed by the UK government against the construction industry for 2025*
One Direction: Industrial Refining Level

To build a digitalized production line through software and data
To promote the construction industry to a modern industrial refining level

Traditional construction and management modes

Modern industrialization level
(greening, industrialization, informationization)
Apple HQ, an “industrial grade” building

1. Painstaking attention to detail
✓ The ceiling should be polished both inside and out.
✓ Door handles, having gone through dozens of prototypes, are precision-milled aluminum rails like MacBook Pro, integrated into the door frame with no visible bolts.

2. Building design should abide by rigid rules with no less standards than those for Apple products
✓ Home button is considered as a benchmark of Apple. Therefore, the elevator buttons resemble iPhone’s Home button.

3. High requirement of elaborate level and technology in construction process
✓ An incredible tolerance of glass measurements, 1/32 inch (around 0.88 millimeter).
✓ No vents or pipes could be reflected in the glass,
✓ Guidelines for the special wood used frequently throughout the building ran to over 30 pages.

4. Extremely high acceptance demands
✓ Workers had to wear gloves according to strict procedures and specifications so that no fingerprints would have been left.
Connotation of Digital Construction

Digital construction refers to the **industrial strategy** which leads the industry's transformation and upgrading by using such information technologies as BIM, cloud computation, big data, IoT, mobile Internet and AI, etc. Combined with advanced lean construction theoretical methods, it integrates people, procedures, data, technologies and business systems, achieves the **digitalization, online and intelligence** of the construction's **entire procedure, total factor and full participant**, and develops a new platformized ecosystem for projects, enterprises and the whole industry, so as to boost the industrial upgrading represented by **new design, new construction and new operation and maintenance**, and to realize the industrial target – **to make every engineering project succeed**.

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<th>Upgrading of</th>
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<td>entire procedure, total factor and full participant</td>
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<td>a new digital construction ecosystem</td>
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Reflection between real and virtual “digital twin”
Entire Procedure, Total Factor and Full Participant

Features

- **Entire Procedure**
The entire lifecycle and process involving buildings’ design, construction, operation and maintenance

- **Total Factor**
Management factors (progress, cost, quality and safety, etc.) and production factors (people, machine, material, method and procedure, etc.)

- **Full Participant**
Upstream and downstream participants of the construction industry chain, such as administrative departments in charge of the industry, construction units, design units, builders, suppliers and manufacturers, etc.

Production Relationship (full participant)

- Digital governments
- Digital property management companies
- Digital colleges and universities
- Digital construction companies

Production Procedure (entire procedure)

- Digital construction units
- Digital design institutes
- Digital intermediary companies
- Digital design materials manufacturers

Productivity (total factor resources, including data, technology, process and method, etc.)
Digitalization, Online and Intelligence

**Digitalization** is the base  **Online** is the key  **Intelligence** is the goal

- Data
- Online (Digital Twin)
- Intelligent

assembly unit industrial chain
concrete industrial chain
steel industrial chain
labour industrial chain
......industrial chain

Digital Construction producing line

- Digital Building producing line
- Digital Pipe producing line
- Digital Park producing line
- Digital City producing line

Project 1
Project 2
Project N
New Design, New Construction and New Operation and Maintenance

**New Design**
**Fully-digitalized Samples**
- To eliminate various engineering risks and optimize the design, construction plan, operation and maintenance plan and cost of the entire lifecycle through VR and intelligent perception
- To satisfy mass personalized demands (mass customization) through digital construction

**New Construction**
**Industrialized Construction**
- The construction process promotes the construction to a refining level of industrial manufacture;
- Drawings are detailed into components, schedule is made for each procedure, and the standardization of procedures and methods is achieved;
- Plant industrialization + construction site industrialization;
- Field informationzation + office informationization.

**New Operation and Maintenance**
**Smart Operation and Maintenance**
To upgrade the construction into a perceptible, analyzable, controllable and self-adaptive smart system.

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**Digital Construction Platform**
An Internet platform for construction industry is formed by using such information technologies as BIM, cloud computation, big data, IoT, mobile intelligent terminal and AI, etc. and combining with advanced theoretical methods for lean construction and project management.

**Digital Twin**
New Digital Construction Platformized Ecosystem

Engineering Project
main works | technical measures | provisional facilities

To make every engineering project succeed
process quality safety environmental protection cost

Six Empowered Sectors
1. Client & Project
2. Marketing Channel
3. Core Technologies/Standards
4. Product Methodology
5. Brand
6. Capital

Digital Construction Platform
BI M+PM
Digital construction platform empower win-win of ecosystem

Glodon digital construction platform single-point→ecology
Application and Practice of Digital Construction

- **Project**
  - Wanda Group

- **Enterprise**
  - Hunan Construction Engineering Group

- **Industry**
  - Guizhou Trading Center

- **Equipment & Materials**
  - Kaili central air-conditioning
Strategic Layout: 1+3 Business Development System

Digital construction platform

Software services

Data services

Financial services

Professional application software

DM & AI

Terminal + Cloud

Formation of “Two Introductions and Two Circles” of the platform assets

Valued-added service

Customers’ operator

To make every engineering project succeed
Our Future

From first undertaking

From enabling estimators to throw away calculators
From professional software application tool
From an assistor to the construction industry’s development
From the No. 1 construction cost software in China

To second undertaking

To making every engineering project succeed
To a digital construction platform
To a core engine for industrial transformation and upgrading
To a leading digital construction platform service provider in the world