

Digital Transformation and Enterprise Architecture Modeling of Global Container Shipping Companies

Hang Wei

School of Shanghai Maritime University, Shanghai, 200000, China

Abstract

At present, the new competitive environment and traditional industries are undergoing fundamental changes. Enterprise digital transformation can become an effective tool to gain competitive advantage, but its success requires concerted action from strategic vision to implementation. New architecture solutions are needed to ensure strategic consistency between business and its architecture for further successful development. The purpose of this paper is to provide a conceptual method and approach for the enterprise architecture modeling of global container shipping companies, so that enterprises can develop effectively, reduce negative effects and benefit from the changes of global business forms and methods.

Keywords

Enterprise Architecture; Balanced Scorecard; Capability Based Planning; Container Shipping Company.

1. Introduction

All manuscripts must be in English, also the table and figure texts, otherwise we cannot publish your paper. Please keep a second copy of your manuscript in your office. When receiving the paper, we assume that the corresponding authors grant us the copyright to use the paper for the book or journal in question. Should authors use tables or figures from other Publications, they must ask the corresponding publishers to grant them the right to publish this material in their paper. Use *italic* for emphasizing a word or phrase. Do not use boldface typing or capital letters except for section headings (cf. remarks on section headings, below).

Do not number your paper: All manuscripts must be in English, also the table and figure texts, otherwise we cannot publish your paper. Please keep a second copy of your manuscript in your office. When receiving the paper, we assume that the corresponding authors grant us the copyright to use the paper for the book or journal in question.

1.1. Enterprise Strategic Alliance Method Section Headings

1.1.1. Strategic Planning

The strategic planning process includes five steps: selecting the enterprise mission and main objectives, analyzing the external environment, analyzing the internal environment, selecting the organizational strategy and implementing the selected strategy. However, these five steps are not enough to achieve the purpose of ESAM [1]. A valuable addition to these steps is the evaluation and control steps proposed in [2]. ESAM subdivides these steps into eleven stages: vision process, business model, environmental analysis, strategic choice, strategic choice, strategic elaboration, strategic measurement, implementation design, transformation planning, implementation governance and strategic evaluation. Each phase contains at least one policy model.

1.1.2. Digital Economy

The digital economy has spawned several new business models. Modern information and computer technology enable many types of business to be carried out on a larger scale and over a longer distance. The main features of digital economy are as follows[3]:

- 1) Liquidity;
- 2) Rely on data and user participation;
- 3) Network effect;
- 4) Multifaceted business model;
- 5) Monopoly or oligopoly tendency;
- 6) Volatility. [4]

It is necessary to develop the following architectural approach concepts for the global corporate enterprise architecture:

1. Digital business ecosystem Architecture [5].
2. Development of new network communication and new storage and data processing technologies
3. The strong internal relationship between the three main aspects (i.e. EA model, data from enterprise information systems and Internet of things devices, and advanced analysis) [6].

1.2. Business Model

The business model describes the basic principles of the establishment, development and successful activities of the company. According to the business model canvas, the company's business model consists of nine modules, which reflect the logic of the company's activities and aim to generate profits[7]. These nine segments cover four main business areas: customer relations, value proposition, corporate infrastructure and financial efficiency. Business model is like a strategic plan, which is realized through organizational structure, processes and systems. The digital transformation of global container shipping companies will affect all nine parts of the company's business model [8].

The target reference business model of global container shipping companies is shown in Figure 1.

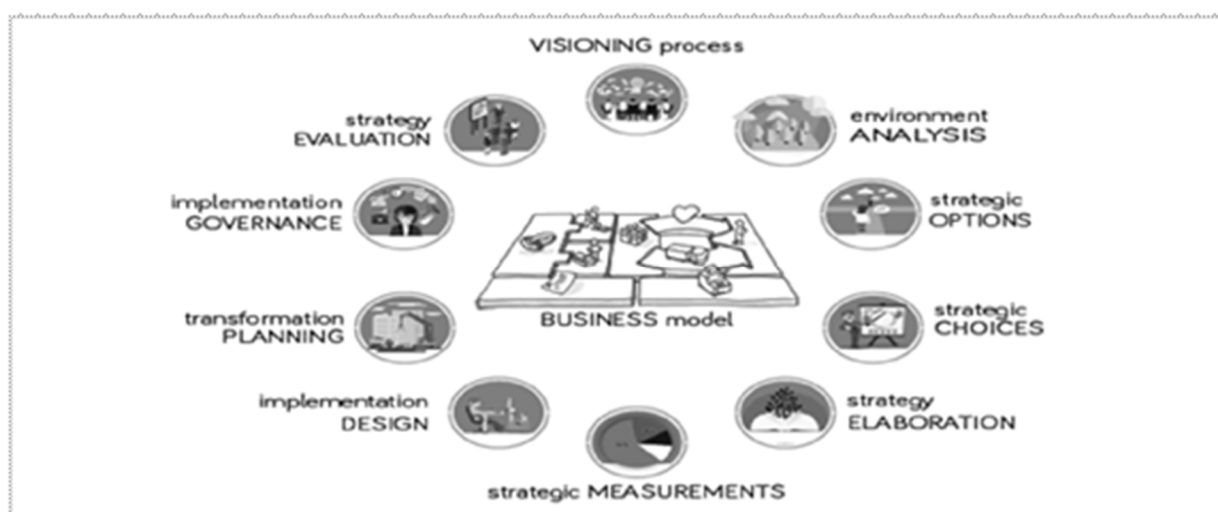


Figure 1. The target reference business model of global container shipping companies

2. Supply Chain Management

There is a direct relationship between the company's value and its business model, because the business model adopted determines the company's future cash flow[9]. As the global container shipping company is a logistics network and the basis of international supply chain, it is necessary to regard company management as value-based supply chain management[10].

2.1. Frame

The proposed balanced scorecard reference model is a logical extension of the value based supply chain management framework, including the reference model from the perspectives of finance, customer, internal process and organizational ability[11].

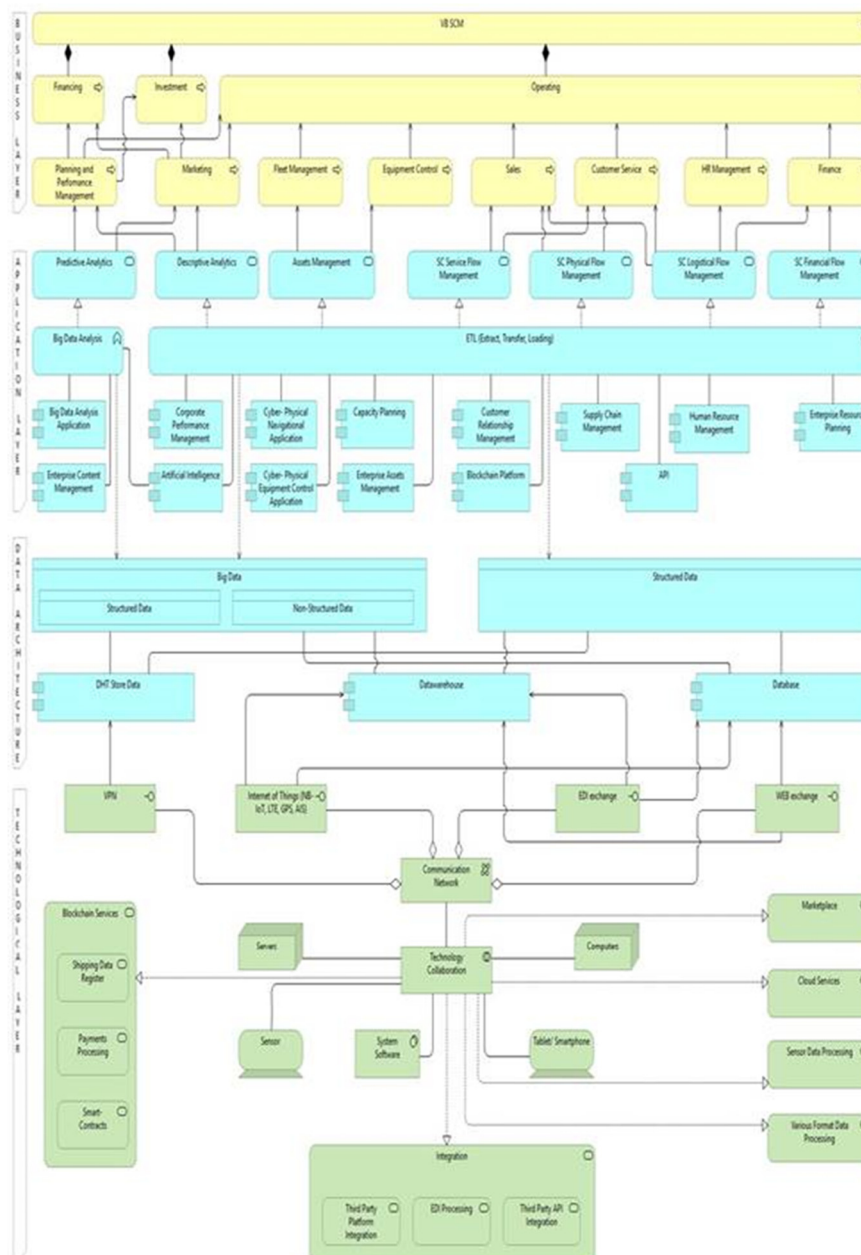


Figure 2. Conceptual framework of value-based supply chain management

The financial perspective represents a set of objectives of operation, finance and investment activities, and the strategic objectives should also define the financial situation of the

company[12]. The realization of the strategic goal of digital transformation will enhance the long-term shareholder value of the company. The strategic objectives from the perspectives of customers, internal processes and organizational capabilities are specified through the decomposition of driving factors into financial objectives [13].

2.2. TOGAF

Togaf was originally used as a general framework and method to develop technical architecture, but later developed into an enterprise architecture framework and method, which can be used as a tool for enterprise architecture design[14].

Architecture development method (ADM) is considered to be the core of togaf. It includes a step-by-step cycle method to develop the whole enterprise architecture. It will provide necessary support for the enterprise architecture modeling of global container shipping companies. [15] Archimate language and Archi modeling tool are successfully used by researchers for enterprise architecture analysis and modeling, and are applied to targeted reference enterprise architecture[16].

The target enterprise architecture model should be based on the following requirements:

- 1) Comply with the concept of global corporate structure;
- 2) Strategic map reference model in line with the perspective standard of organizational capability[17];
- 3) Ensure that the objectives of the strategic map reference model in internal processes, customers and finance are achieved.

3. Conclusion

Enterprise digital transformation can become an effective tool to gain competitive advantage, but its success requires concerted action from strategic vision to implementation. New architecture solutions are needed to ensure strategic consistency between business and it architecture for further successful development.

Global container shipping companies have good conditions to implement new technologies, so as to make use of their advantages all over the world, but this large-scale process needs to be handled in an appropriate way. The enterprise architecture modeling method based on the Balanced Scorecard proposed in this paper can become an effective tool for the planning and implementation of digital transformation of global container shipping companies.

Acknowledgments

The research work of this paper is completed under the careful guidance of the instructor. I would like to extend my highest respect and heartfelt thanks to my mentor. In scientific research, teacher Zhao Ning's extensive knowledge, rigorous academic attitude and realistic scientific research spirit infected and inspired me. I benefited a lot from his careful guidance and strict requirements. At the same time, I would like to thank my classmates for their help to complete the work of this paper smoothly. Finally, I would like to thank all the teachers of the defense group for their suggestions. I will do better.

References

- [1] The Digital Imperative in Container Shipping (2018). The Boston Consulting Group. <https://www.bcg.com/ru-ru/publications/2018/digital-imperative-container-shipping.aspx>.
- [2] Rogers, D.L. (2016). The digital transformation playbook. Rethink your business for the digital age. Columbia University Press, USA.

- [3] Mintzberg, H. (1990). The design school: Reconsidering the basic premises of strategic management. *Strategic Management Journal*, 11(3), 171-195.
- [4] Henderson, J.C., Venkatraman, N. (1999). Strategic alignment: Leveraging information technology for transforming organizations. *IBM Systems Journal*, 38(2-3), 472-484.
- [5] Roelfsema, M., Aldea, A., Lankhorst, M., Franken, H. (2016). How about strategy? A survey into the pitfalls of strategic alignment. *Journal of Enterprise Architecture*, 12(1), 7-18.
- [6] Aldea, A. Enterprise strategic alignment method. (2017) A cross- disciplinary capability-driven approach: PhD thesis. University of Twente, The Netherlands. [https:// ris. utwente. nl/ws/ portalfiles /portal/6045124](https://ris.utwente.nl/ws/portalfiles/portal/6045124).
- [7] C.W. Hill, G.R. Jones, *Strategic management: an integrated approach*, Cengage Learning, Boston, USA., 2008.
- [8] A.Aldea, M.E. Iacob, D. Quartel, H. Franken, *Strategic planning and Enterprise Architecture*, Enterprise Systems Conference, Cape Town, South Africa, 7-8 November 2013.
- [9] J.D. Hunger and T.L. Wheelen, *Essentials of strategic management*, New Jersey: Prentice Hall, 2003.
- [10] Osterwalder, A. (2010). *Business Model Generation*. New Jersey, USA.
- [11] Sandkuhl, K. and Stirna, J. (2018) *Capability Management in Digital Enterprises*. SpringerVerlag, Berlin.
- [12] Ulrich, W. and Rosen, M. (2011) The business capability map: building a foundation for business/ IT alignment. Cutter Consortium for Business and Enterprise Architecture. [Online], [retrieved February 28, 2016], [enterprise-architecture/sample-our-research/ ea11 0504. Html http:// www. cutter. com/content-and-analysis/resource -centers/](http://enterprise-architecture/sample-our-research/ea110504.html).
- [13] Brandenburg, M. (2013) *Quantitative Models for Value-Based Supply Chain Management*. Springer-Verlag, Berlin.
- [14] Kaplan, R.S. and Norton, D.P., (2004), *Strategy Maps: converting intangible assets into tangible outcomes*, Harvard Business School Press, USA.
- [15] Lankhorst, M. et al. (2017) *Enterprise Architecture at Work. Modelling, Communication and Analysis*. Springer- Verlag, Berlin.
- [16] OECD/G20 Base Erosion and Profit Shifting Project. Addressing the Tax Challenges of the Digital Economy ACTION 1: 2015 Final Report. Available at <http://www.oecd.org/tax/addressing-the-tax-challenges-of-the-digital-economy-action-1-2015final-report-9789264241046-en.htm>.
- [17] Gomez-Uranga, M. et all (2016). *Dynamics of Big Internet Industry Groups and Future Trends*. Springer, Switzerland.