



# Trade Firms Digital Economy Quality Development Modelling: An Empirical Study Based on EED-Metaphor Corpus

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**Abstract.** This paper, based on the epigenetics and the evolutionary economics paradigm, proposes EED theory as theoretical framework to conduct a study on digital economy quality development of trade firms. An EED-Metaphor Corpus is constructed to empirically study the digital economy driving force and the process of digital upgrading of trade firms. Based on the results and findings of the Corpus, this paper further analyzes the mechanism of the digital quality development model of trade firms and draws corresponding conclusions.

**Keywords:** Trade Firms · Digital Economy · EED-Metaphor Corpus · Quality Development

## 1 Introduction

Nowadays, digital economy, as a brand-new economic form, is becoming an important driving force to promote the quality development of trade firms with efficiency enhancement. As the epidemic spreads around the world, many overseas orders of the trade firms have been severely affected. In order to outsmart the impact of the epidemic on foreign trade domain, quite a myriad of counter measures were adopted and launched by the policy makers, as well as those trade firms, to alleviate the impact of the epidemic on foreign trade sector. Simultaneously, foreign trade firms were encouraged to vigorously develop digital means to go to the “cloud” to branch out to the new markets online in the cyber world. Thus, it is of great realistic significance to conduct a study on the digital economy quality development of trade firms.

## 2 Literatures

### 2.1 Literatures of Epigenetics

In terms of epigenetics, in 1942, Conrad Waddington coined the term “epigenetics” to define and describe the phenomenon that the genotype has not changed yet its phenotype has changed, and to further explain the aspects of organism development. In the past decades, scientists discovered that the epigenetic mechanism of gene expression model

delivery does not actually depend on changes in DNA sequence, yet is achieved by changing the state of chromatin, which is a biological inheritance with physiological form of information [1].

David Allis and Thomas Jenuwein [1] clarified the two common states of its existence, namely euchromatin and heterochromatin, and their chain reaction relationship with gene activity; David Allis and Thomas Jenuwein [1] also proposed the modern era of epigenetic research, coming up with the histone code hypothesis and related theories, histone modification and DNA methylation, followed by studies on protein variants and all chromatin markers; this is systematically similar to the same work for the digital economy metaphor corpus identification in this study.

## 2.2 Literatures of Economic Metaphor Model

In terms of economic metaphor, it is taken as the scientific system metaphor (Closkey 1983; Lakoff and Johnson 2003), which is closely related to “ontology”, functioning as an explanatory framework and systematic modeling [5, 8]; economic metaphor has not only attracted the attention of linguists, but also increasingly appealed to the economists because of its source and practical experience [10]. In addition, the systematic “mapping” of metaphor is actually a kind of “model” in that an essential means for empirical economics research has, as a rule, been a “model”. Therefore, “model” has functioned as “linking point”, connecting the metaphorical economic theory. In essence, economic metaphors and economic models have a lot in common in reality [5, 10]. According to McCloskey’s research paradigm, the method of “economic metaphorical discourse analysis” can be used to resolve the practical dilemmas and methodology of contemporary economics, which also provides the theoretical basis of economic metaphorical thinking for this research on the digital economy.

## 2.3 EED Theory and Trade Firm Digitalization

Digital trade functions as a sub-form of service trade, and cross-border e-commerce is its main typical representative, which also provides a foreign trade enterprise, especially those foreign trade enterprises in the epidemic. This actually renders a new path and great development direction of transformation in digitalization [2–4, 9, 11]. Many research literatures pointed out that the digitalization transformation of foreign trade enterprises, as well as the upgrade process, is not simply just through the establishment of a special “digital technology department” in the company’s organization structure to enhance the profitability and expansion channels of foreign trade enterprises [6, 7, 9, 12, 13], but also to achieve cross-industry “intelligent manufacturing with foreign trade enterprises or foreign trade-oriented manufacturing through digital technology, brand impact and communication [3, 4], big data in the depth mining of the foreign trade industry, internal integration and sharing, its nature lies in information data for these new economic production resources in cross-industrial external resource depth integration [4, 6, 7, 11]; foreign trade enterprises’ transformation ultimate goal is to ultimately reach digital technology-driven stage [2–4, 9, 11], especially with those high-level enterprises that are high quality supplied by product services. According to the production theory of classical economics, foreign trade enterprises are generally constrained by various

production factors (with digitally characterized), such as digital technology supporting systems (TECH), labor adapter channels (TECH), and labor. Labor, the investment capital of digital research (K) and the “Land and Facility” required by the digital economy, from the perspective of evolutionary economics, the construction of a full range of digital trade operation eco-tries; there is an urgent need to be reasonably configured, and synergistic to achieve digital (numerous) transformation and upgrading of foreign trade enterprises with an efficient “Paro” path.

Based on the theory of epigenetics and the paradigm of evolutionary metaphor economics, this study proposes Epigenetics E (Evolution + Economics) D (Digitalization + Dynamic), referring to as an EED theory, as theoretical frame.

### 3 Model Design and Corpus Construction

#### 3.1 Model Design

Based on the latest research progression of epigenetics and the cutting-edge achievements of evolutionary metaphor economics, this paper constructs a metaphorical model of digital economy transformation and upgrading of trade firms, which focuses on the chromatin marker subsystem. This paper applies the metaphorical method of evolutionary economics, and specifically combines the theory of economic metaphor [5, 8, 10]. to match the specific object of this research, namely, digital quality development, and constructs a marked transformation and upgrading model for the economic transformation and upgrading of trade firms with quality development mechanism and path.

#### 3.2 Corpus

By means of field surveys of local trade firms, in-depth interviews and questionnaire surveys, the research group collects data in a text-form manner to establish a digital economy corpus. The corpus is mainly based on series of in-depth interview with local trade firms’ managers and executives, in terms of the entire process of digital transformation and upgrading.

### 4 Results and Discussion

After the establishment of the EED-Metaphor Corpus, we applied the AntConc3.2.1W to search and examine the in-depth interviews discourse of the trade firms’ managers and executives, covering the economic digitalization.

As shown in Fig. 1, the word list (Total W-Token: 3075) was conducted searching, and the meta-language words were filtered: “the (R1, Freq198), and (R2, Freq165), of (R1, Freq136), to (R7, Freq57)”, and the subject words of this study were filtered: “trade (R4, Freq103) foreign (R5, Freq97) digital (R6, Freq66)”. Subsequently, the most effective high-frequency keyword was founded and recognized as “innovation (R8, Freq56)”, which accounts for 56/783 in a Total W-type of 783. Taken into account both of the ranking and frequency, the key word “innovation (R8, Freq56)” has high reliability

Rank	Freq	Word
1	198	the
2	165	and
3	136	of
4	103	trade
5	97	foreign
6	66	digital
7	57	to
8	56	innovation
9	53	in
10	38	transformation
11	37	ability
12	35	is
13	31	a

Fig. 1. Word list

and validity. So the key word “innovation” was clicked to continue and resume the concordance examination.

As shown in Fig. 2, the key corcodance of “mechanism innovation, self-org innovation, innovation driving, innovation performance as well as innovation evolution” are all fairly prominent. This empirically reflects the marked transformation and upgrading model with innovation driving and technology spillover effects as the main foundation and key motivation. Furthermore, according to the theory of self-organization enterprise, technology serves as an important part of the evolution of enterprise self-organization growth and development; technological innovation functions as the core of the start-up of enterprise organizational mechanism innovation.

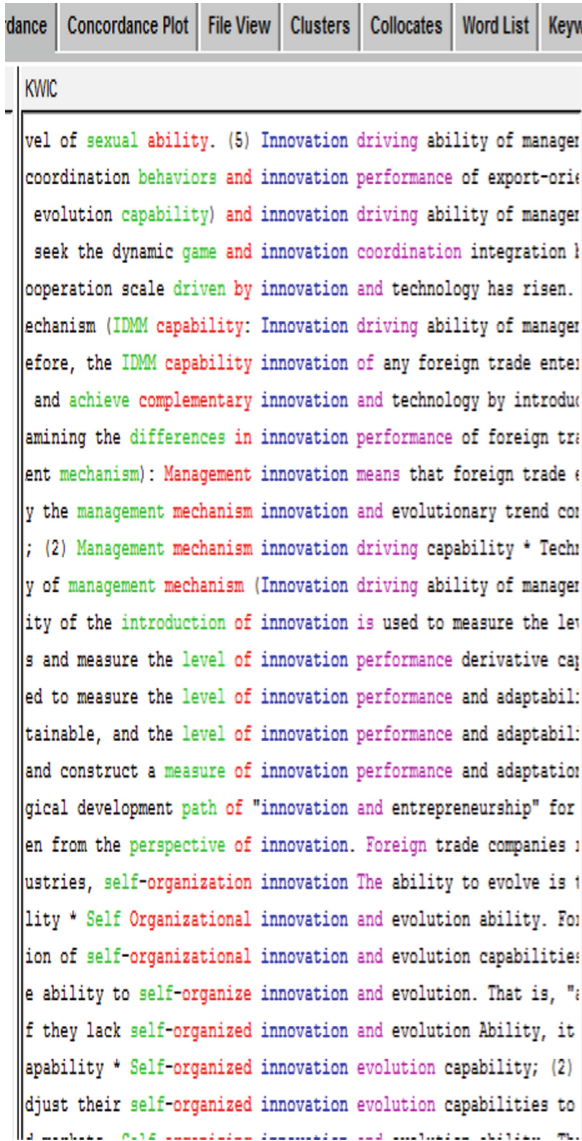


Fig. 2. Concordance of innovation

As shown in Fig. 3, the innovation concordance plot empirically shows that innovation drive is least significant in the early phase of digital transformation. This identification is similar to methylation blocking the inheritance of genetic information in the chain, and then metaphorically prevents some non-digital organizational practices which are transmitted within the enterprise organization. Quite noticeably, innovation is mainly concentrated in the middle and last phases of digital transformation (the thickness of the vertical line in the figure represents the criticality of its time axis development),



**Fig. 3.** Concordance plot of innovation

and again from the time event node, it proves that the transformation and upgrading model of the remarkable innovation drive and technology spillover effects are the main foundations and key motivations.

The above findings and results evidently indicate that innovation drive is the source of enterprise development; the dynamic configuration of resource elements during the innovation driving process ultimately resembles the organization's cognition, thinking style, digital innovation technology between enterprises or sectors, eventually forming new technological innovation drive path dependence.

The above findings and results also reveal that the marker transformation upgrade model of EED is mainly based on innovative driver and technical spillover effect. For digital economic perspectives, foreign trade enterprises' transformation and upgrading drive factors are "digital infrastructure construction", and digital economic technology is a new technological innovation. The introduction of the model, as its "heterogeneity" is different from the "heterogeneity" theory of traditional foreign trade enterprises, namely digital economic and technological innovation "heterogeneity, this model ultimately based on its economic metaphor" upper "dyeing quality standard subsystem methylated enzyme results in methylation of DNA, and its effect is "negative transfer" to prevent and play as a barrier in the transmission of certain genetic information, thereby directly leading to the deactivation of the original gene, and new methylated cells appear with certain code of replication.

The above findings and results also suggest that digital economic technology innovation" heterogeneity "will also change the business decision-making method and organizational behavior, thereby forming a brand new technological innovation drive path dependence, achieving digital high quality development.

## 5 Conclusion

A conclusion can be drawn based on the above discussion that the digital economy element "metaphorically" acts as a methylase, which marks, metaphorically, certain tangible goods or intangible services of trade firms (such as digital trade in trade of service). Moreover, the imprint of the digital economy, or, in accordance with the paradigm language of the corpus, the digital economy "metaphorical identification" is with an identification resembling the methylation process of blocking the inheritance of genetic

information in the chain, and then “metaphorically” prevents some non-digital organizational practices transmitted within the enterprise organization, and this mode is to realize the transformation and upgrading of trade firms with quality development.

The marked transformation and upgrading model is based on innovation drive and technology spillover effects as the main base and key motivation. Technology is an essential pivotal of trade firm organization, and technological innovation is the core of the startup of enterprise organization mechanism innovation. And it has an important technology spillover effect “positive transfer” impact on other factors, which is not only reflected in the way of completing the tasks of foreign trade orders, but also in the process of using O2O innovative mode in foreign trade orders processing to affect the operating mechanism of foreign trade organizations, corporate management systems, foreign trade industry practices and other factors with extensive social attributes. The process of using the “heterogeneity” of technological innovation in the digital economy tends to change the decision-making mindset and organizational behavior of enterprises, thereby forming new technological innovation-driven path dependence and realizing digital quality development.

In a nutshell, it can be summarized as the mechanism of the digital quality development mode of trade firms in terms of three main contexts, namely, the external environment, technical innovation context and organizational context; this study is refined into “foreign trade enterprises” and “digital transformation” dimensions, that is, three elements in foreign trade enterprises have influence their digital use and implement digital technological innovation: foreign trade enterprises organize the environment. The foreign trade enterprise responses to the environment according to several descriptive indicators, namely the size of foreign trade enterprises, the intensive industry concentration, the industrial formation, the management structure of foreign trade enterprises, the quality of human resources. A very important path link of mechanisms across the boundary is that internal availability resources communicate with the company’s external environment. Digital transformation technology innovation driving describe internal and external technologies associated with foreign trade companies. This environment may include current foreign trade practices and digital devices inside the foreign trade company and external digital technology libraries outside the company. The external environment is a premises where companies carry out trade (foreign trade + domestic trade) business, and this competition impact in each other is reflected and mapped in the external competition market, and in the macro environment, the macro environment is characterized by cooperation with macro-level organizations to obtain others, such as resources and transactions. All of these factors can function as a very well and convincing digital economic metaphor for foreign trade companies from seeing market demand, seeking and introducing new digital technology, and outsmarting those limits by savvy digital technology innovation.

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