Basic Law of Information:

Fundamental Theory of Generalized Bilingual Processing

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1. Introduction

- This article **aim**s to introduce basic law of information - -fundamental theory of generalized bilingual processing popularly.

  The generalized bilingual processing can be divided into **three categories**:

  narrow bilingual processing, such as Chinese and English;

  alternative bilingual processing, such as terms and sayings;

  generalized bilingual processing, such as mathematical language (arithmetic figures for example) and natural language (Chinese characters for example). [1]

Three kinds of bilingual processing method according to the three laws

- They are general text in broad sense.
- Basic Law of information contains:
- A, existence of the real basic information as an axiom;
- B, law of human-computer interaction; and
- C, law of interpersonal communication.

2. Methods

- Through generalized bilingual information processing, especially by comparing two types of formal strategy, we on the one hand inherit software engineering strategy as language understanding[6], knowledge representation[7], pattern recognition, and on the other hand, create systematic engineering strategy as generalized bilingual , knowledge ontology[8], bilingual programming.

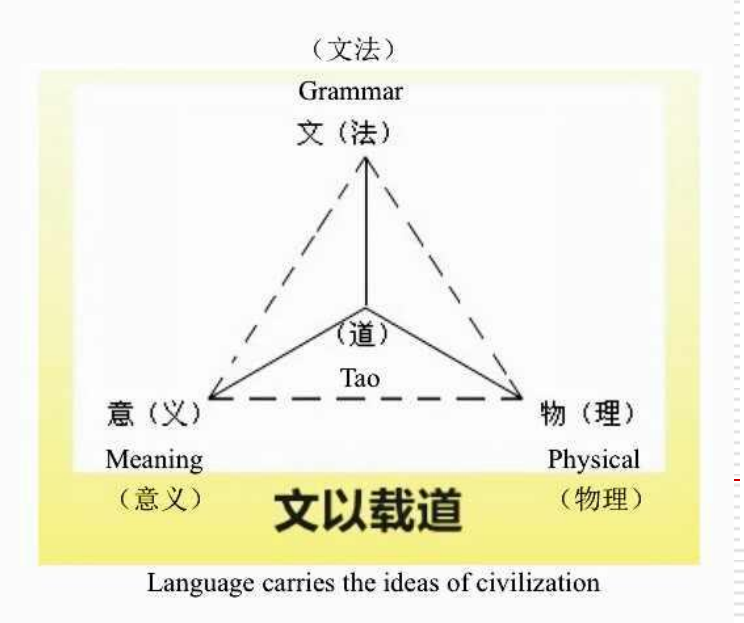
- Based on the research foundation of two categories of formal strategy, this article temporarily puts aside the technical problems in the past formal paths but only to discuss the results of our comparative study, namely systematic engineering strategy as generalized bilingual, knowledge ontology, bilingual programming.
- The following highlights three operable basic steps and their three supporting models as well as theoretical basis, involving two types of instances penetrating macro and micro.

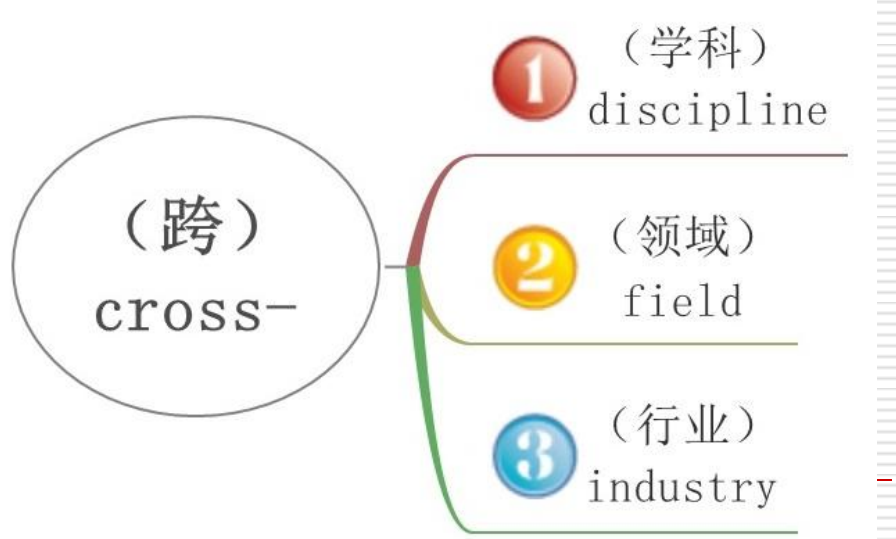
Step 1 and Model 1:

- The butterfly model for Chinese-English translation refined by the author is developed on the basis of the research results of Weaver[9] and Vauquois [10].
- Predecessors envisaged there exists an intermediate language in statistics and rules-based machine translation, but the author finds it indeed does not exist. One pair of a series of bilingual pairs can be understood as interlanguage at the best and the key is the construction of bilingual pair.

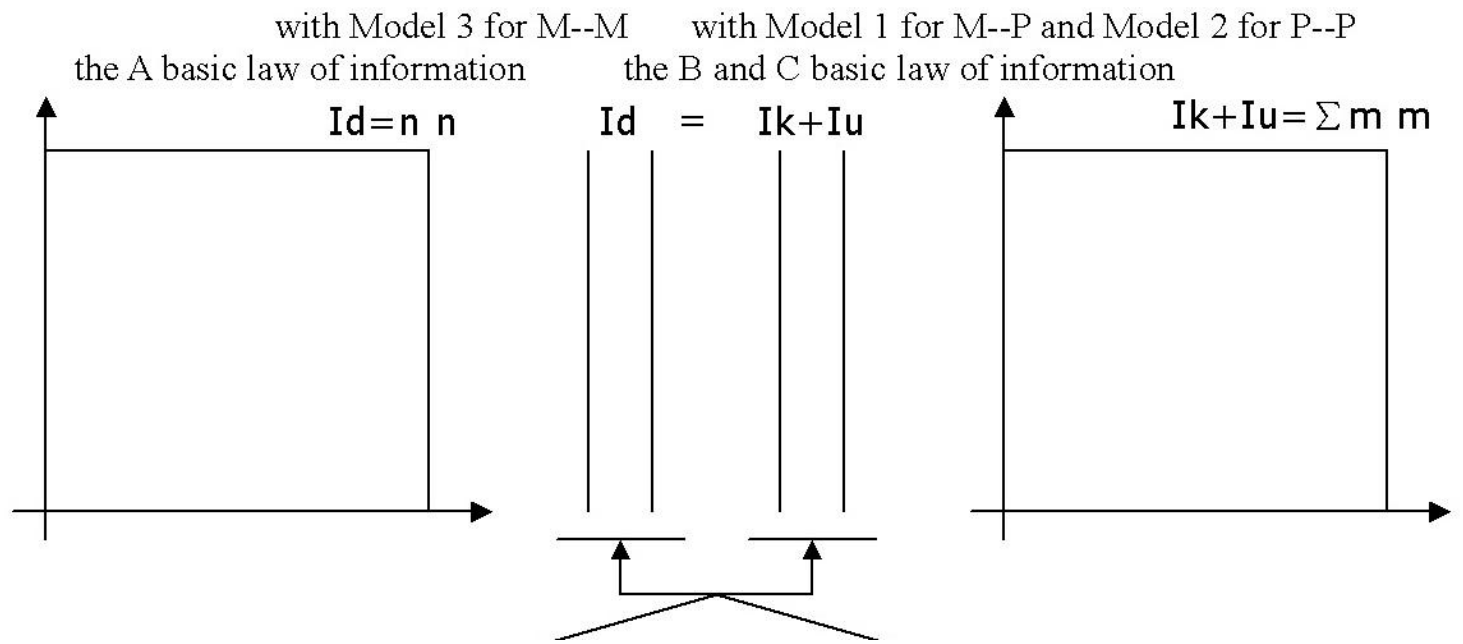
Step 2 and Model 2:

- The knowledge and common sense **ontology model** refined by the author optimizes several basic categories of human cognitive development and knowledge accumulation process as a whole including the most basic qualitative analysis of the semantic triangular and detailed qualitative analysis of the three cross-division. The former depicts the entire human knowledge hierarchy and the latter bridge the gap between interdisciplinary, cross-field, cross-industry terminology known as knowledge segmentation system.





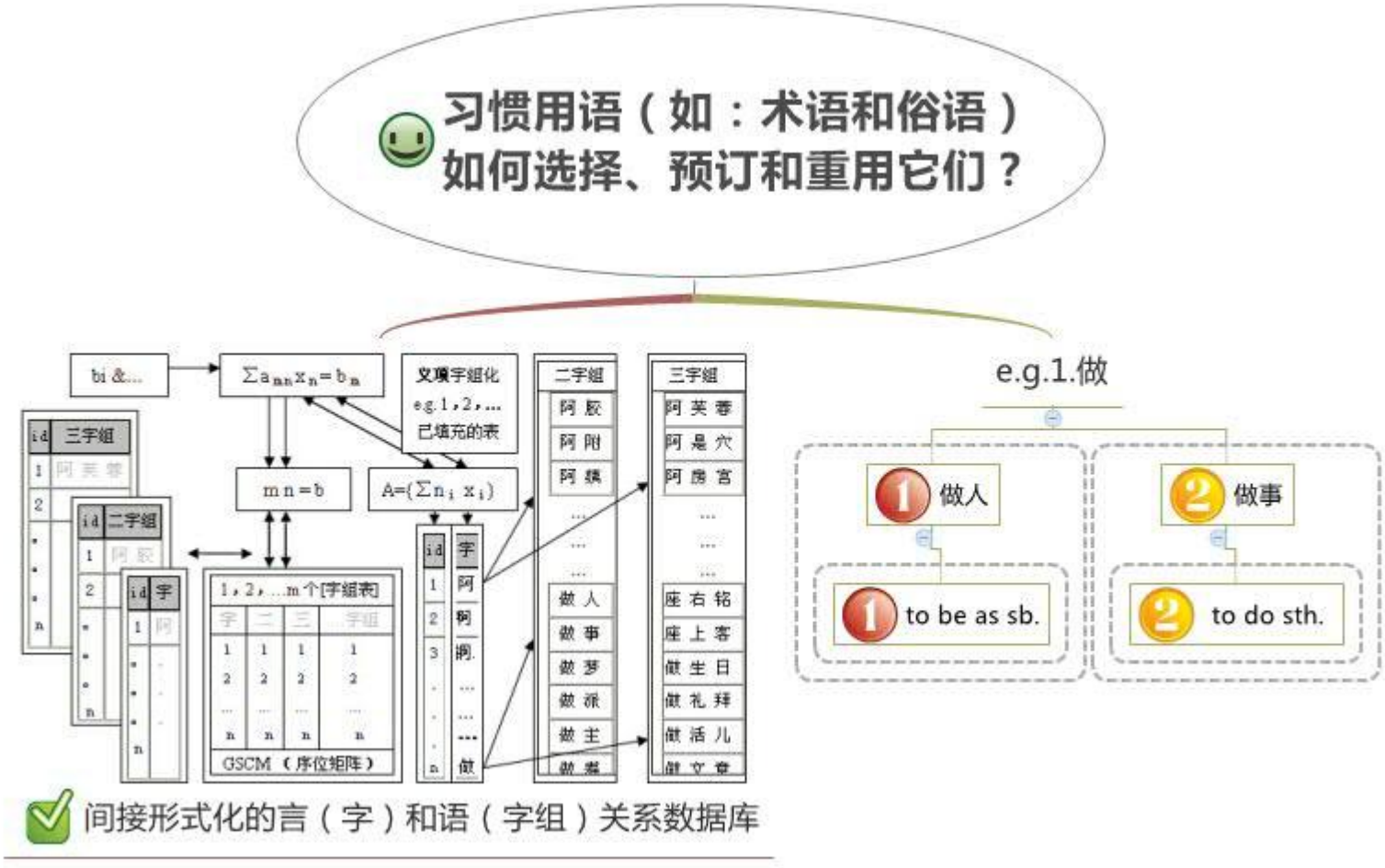
Step 3 and Model 3:



- The three types of bilingual information processing system called synergy model constructed by the author can form super "Chess" of three types of bilingual and large-span "language game" by combining Saussure's metaphor of language system as "Chess"[11] and Wittgenstein's metaphor of language as "language game" [12] with generalized bilingual microscopic model and practical relational databases as well as model one and model two. All kinds of ambiguity are in this process and can be gradually solved following three laws.

3. Results

the combination of standardization together with individuality, pluralism and diversification achieve the best human - computer interaction results.



Information Basic Law A B C

- Information Basic Law A
- "sequence-position relationship, the only conservation“. Digital information: Id; constant: n.
- Formula： Id = n n; Digital matrix: n n
- Information Basic Law B
- "Equivalent (sequence-position), Parallel; Corresponding, Conversion“.
- Formula：Id = Ik + Iu; Total amount; Known component, Unknown component.
- Information Basic Law C " Synonymous (meaning), Parallel; Corresponding, Conversion"
- Formula：Ik + Iu = Σ m m. sum of some constants

Causal between theory and practice Causal between cognition and behavior

- The relationship between three types of bilingual transformation model 1-3 and three information basic laws ABC is: A3B and 1C2.
- The effectiveness of generalized bilingual information processing method lies in achieving
- reasonable division, complementary advantages;
- high collaboration, optimized interaction
- not only between persons, person-machine, machines, and machine-person
- but also the three types of bilingual.

4. Conclusion

- Its **significance** is that Turing's "computability" topic and Searle's "Chinese room" topic can be considered as two special cases of Xiaohui's "the twin matrix as words and numbers as chessboard" topic, thus highlighting the information basic law and its practical value.[13-16]

Theoretically broaden the mind:

- It is compatible with the convergence of formal information theory [17] and the openness of semantic information theory [18].
- The former is characterized by formal and computable; the latter is characterized by diversity and complexity.

Practically play a role:

- Adopting generalized bilingual information processing method may exceed and lead the two factions' point of view, namely strong AI and weak AI, to achieve accurate machine translation in three types of bilingual collaborative processing system, which can not be achieved either by ordinary human beings or computers respectively.

In conclusion

- In conclusion, it can be said that discovering three basic information laws clarifies the basis for collaborative translation of three types of bilingualism, achieves generalized bilingual information processing, which proves the existence of three types of bilingual collaborative translation mechanism since they are of mutual causal relationship.

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