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Computational Linguistics and Its Role in Making the Specialized Lexicon: A Proposal for a Computerized Economic Lexicon

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Abstract:
This research paper aims to highlight the importance of computational linguistics and its relationship with the making of specialized lexicons, given the significant developments witnessed in our era, particularly in the Arabic language and lexicography. The specialized lexicon is based on a set of scientific terms, ranging between classical Arabic and borrowed foreign words, with their equivalents presented in various foreign languages and arranged in a specific order. Such a lexicon can appear in both print and electronic forms.
The importance of this study lies in emphasizing the role of computational linguistics in constructing a specialized lexicon through translating its entries and identifying their foreign equivalents. Accordingly, this research focuses on a selection of terms belonging to the economic field, with the aim of processing and classifying them into a specialized lexicon consistent with the mechanisms of computational linguistics.
The study adopts the descriptive method, which suits the nature of the topic, by describing the structure of the specialized lexicon and analyzing its entries in terms of content. The most significant result reached by this research is the creation of a bilingual (Arabic–English) computerized economic lexicon entry sheet that contains economic terms, intended to facilitate the process of searching for terms.

Keywords: *Computational linguistics, lexicography, computerized economic lexicon, terminology, bilingual lexicon.*

La linguistique informatique et son rôle dans la création du lexique spécialisé : une proposition pour un lexique économique informatisé

Résumé :
Cet article de recherche vise à souligner l'importance de la linguistique informatique et son lien avec la création de lexiques spécialisés, compte tenu des développements significatifs observés à notre époque, en particulier dans le domaine de la langue arabe et de la lexicographie. Le lexique spécialisé repose sur un ensemble de termes scientifiques, allant de l'arabe classique aux mots étrangers empruntés, avec leurs équivalents présentés dans différentes langues étrangères et classés dans un ordre spécifique. Un tel lexique peut se présenter sous forme imprimée ou électronique.
L'importance de cette étude réside dans le fait qu'elle souligne le rôle de la linguistique informatique dans la construction d'un lexique spécialisé grâce à la traduction de ses entrées et à l'identification de leurs équivalents étrangers. En conséquence, cette recherche se concentre sur une sélection de termes appartenant au domaine économique, dans le but de les traiter et de les classer dans un lexique spécialisé conforme aux mécanismes de la linguistique informatique.
L'étude adopte la méthode descriptive, qui convient à la nature du sujet, en décrivant la structure du lexique spécialisé et en analysant ses entrées en termes de contenu. Le résultat le plus significatif de cette recherche est la création d'une fiche d'entrée de lexique économique informatisé bilingue (arabe-anglais) contenant des termes économiques, destinée à faciliter le processus de recherche de termes.

Mots clés : *linguistique informatique, lexicographie, lexique économique informatisé, terminologie, lexique bilingue*

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Introduction:

Today's world is built upon the most sophisticated technologies achieved through continuous technological advancement. Language has kept pace with this development by entering the realm of digitization within what is known as computational linguistics. This field represents one of the branches of applied linguistics, which focuses on studying language through the use of computers by monitoring linguistic phenomena according to their various levels: phonetic, morphological, syntactic, semantic, lexicographic, translational, and pedagogical.

In the 1970s, this field began to emerge among Arab scholars. The first attempt was in Islamic sciences, when researchers entered specific parts of the Holy Qur'an into the computer. Later, they replaced Latin letters with Arabic script, expanding these experiments to achieve scientific interaction between computers and linguistic research. The milestone moment came when Dr. Ibrahim Anis proposed to Dr. Ali Helmy Moussa (Professor of Theoretical Physics) the idea of using computers for linguistic statistics and highlighting their significance in linguistic research. The initial project consisted of compiling statistical data on the roots found in Al-Jawhari's lexicon "As-Sihah".

This pioneering work unfolded through three main stages:

1) **First stage:** Entering the linguistic material into the computer's memory.
2) **Second stage:** Designing a program using one of the computer languages.

3) **Third stage:** Executing the program practically.

The results of this study appeared in the form of statistical tables of the Arabic language, detailing its letters, phonetic sequences, and phonological properties.

Computational linguistics today plays a crucial role in lexicography through its wide range of techniques and applications. It constitutes a foundational tool indispensable for machine translation, automatic proofreading, and semantic and contextual analysis. These technologies save enormous amounts of time when searching for a word or specific piece of information. Moreover, computational linguistics seeks to create terminology banks, by storing terms along with detailed information about each entry to assist translators and learners, while supporting machine translation and the construction of specialized lexicons.

Collaborative efforts between linguists, lexicographers, and computer specialists have led to the development of digital and electronic dictionaries, both general and specialized, to meet the needs of the modern era.

In this research, we attempt to design a specialized lexicon in the economic field, integrating various computational techniques in line with the mechanisms of lexicographic production. The economic sector, in particular, is based on a rich and diverse terminological reservoir, comprising both classical Arabic and borrowed foreign terms, used in multiple languages such as Arabic, French, and English. These form the core material of the proposed computerized economic lexicon.

Accordingly, a sample of the most frequently used Arabic economic terms, especially those in the banking field, has been selected for linguistic analysis, verification, and

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translation into their English equivalents, before organizing them into a bilingual Arabic–English lexicon.

From this standpoint, the following research problem is raised:

- **What are the computational mechanisms employed in the making of specialized lexicons?**
- **What is the nature of the economic terminology included in the computerized economic lexicon?**

Hypotheses

1) The creation of a computerized economic lexicon relies on **lexicographic mechanisms** and **computational techniques**.
2) The **rules of the Arabic language** are essential in determining the nature of commonly used economic terms.

Research Objectives

1) To clarify the relationship between **computational linguistics** and **lexicography** in the construction of a specialized lexicon in the economic field.
2) To identify the nature of **economic terminology**, whether **derived**, **coinaged**, **arabized**, or **borrowed**, and to determine their **equivalents** in both foreign languages and Arabic.
3) To extract the **linguistic levels** that structure the computerized economic lexicon.

Research Methodology

Given the nature of the topic under study and in order to answer the stated research questions, the **descriptive**

method has been adopted. This approach involves describing the **form** of the economic lexicon and analyzing and processing its **content**.

The study is divided into **three main axes** as follows:

- **Axis One:** A general overview of the key concepts — the lexicon, the electronic lexicon, the specialized lexicon, the economic term, and the computational term.
- **Axis Two:** Between **lexicography** and **computational linguistics**:
- **Axis Three:** The role of computational linguistics in the making of a **specialized computerized lexicon** — particularly an **economic computerized lexicon**.

1. A General Overview of the Concepts

1.1. The Lexicon

1.1.1. Definition of the Lexicon – Linguistically:

According to **Ibn Manẓūr** in *Lisan al-ʿArab*, the word *muʿjam* (lexicon) derives from the root ʿ**ajama**, meaning *ambiguity* or *non-Arabic speech*. The Arabs say *aʿjamtu al-kitab* ("I made the text non-Arabic") as the opposite of *aʿrabtuhu* ("I made it clear and articulate"). The term thus originally refers to *making something unclear or indistinct. (Ibn Manẓūr, 1993, pp. 385, 388)*

Abu al-Fatḥ ʿUthman ibn Jinni adds that the root *ʿajama* denotes *obscurity and concealment*, as opposed to *clarity and expression*. *(ʿAbd al-Qadir ʿAbd al-Jalil, 2014, p. 27)*

1.1.2. Definition of the Lexicon – Terminologically:

Terminologically, a **lexicon** is a **reference work** that contains the words of a given language arranged in **alphabetical order**, providing a **definition** for each entry

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along with related **morphological forms**, **pronunciation**, **derivations**, **meanings**, and **various usages**. An example of such a work is *Al-Muʿjam al-Wasiṭ. (Asmaʾ al-ʿAyib, p. 14)*

1.2. The Specialized Lexicon

A specialized lexicon is a reference work that contains a set of terminological entries related to a specific subject, arranged in a particular order. Each term is accompanied by concise and precise definitions, and, whenever possible, supported by visual aids such as images or diagrams that help convey the concept to the user in the clearest possible way. *(Jawad Husni Samaʿnah, 1999, p. 36)*

1.3. The Economic Term

An economic term refers to any concept carrying an economic or commercial meaning, used by specialists in this field within economic and commercial institutions and markets. These terms often denote aspects related to supply and demand, as well as the names of goods, products, inventions, and marketing processes. *(Hisham Ben Mokhtari, 2017, p. 3)*

1.4. The Electronic Lexicon

Electronic lexicons are among the most prominent manifestations of natural language processing (NLP) and constitute one of the main tools for preserving, updating, and developing linguistic memory. They enable users to search for and retrieve information efficiently. Linguists, therefore, have sought to build electronic dictionaries based on encoded tools that utilize data pertaining to different levels of language according to the linguistic program

designed for automatic processing. *(as cited in ʿAli Nabil, 1994, p. 359)*
Electronic lexicons are classified into the following types:

1.4.1. Linguistic Electronic Lexicons:

These consist of samples of words, with each entry containing linguistic information such as the definition of the word, its morphological and syntactic features, orthographic form, and various meanings, accompanied by illustrative examples.

1.4.2. Specialized Electronic Lexicons:

These contain the terminology used in a particular science or field, such as mathematics, chemistry, or medicine. *(Ṣaliḥ Ghilous, p. 28)*

1.4.3. Visual Electronic Lexicons:

These include collections of images and video clips organized according to the subjects they cover (e.g., buildings, animals, games, means of transportation).

1.4.4. Multilingual Lexicons:

These provide translations of words into one or more foreign languages.

1.5. The Computational Terminology (Le Terminotique)

Computational terminology (le terminotique) is the field that deals with the computerized processing of terminological data.

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2. Between Lexicographic Production and Computational Linguistics

2.1. Definition of Lexicographic Production

Lexicographic production, known in French as la lexicographie, is a branch of lexicology that deals with the art of compiling, editing, classifying, and printing dictionaries. This field rests upon four fundamental pillars: editing, compilation, classification, and publication.

According to Hilali H. Hallam (1987, p. 6), lexicographic production is defined as:

"A science concerned with the making and composition of dictionaries. It focuses on collecting lexical material, describing it, arranging it alphabetically or thematically, and defining and explaining its entries."

It is also referred to as **lexicographic authorship**, which involves **gathering information and facts, selecting entries, organizing them according to a specific system, writing the entries**, and finally **publishing** the finished product — the **dictionary or lexicon** itself. *(Ali Al-Qasimi, 1991, p. 3)*

The difference between lexicographic production and lexicographic study lies in their scope and purpose: the end of lexicographic production marks the beginning of lexicographic study. The result of lexicographic production — general and terminological dictionaries — becomes the raw material and starting point for lexicographic research. *(Noureddine Makwar, ALUKAH.NET/SHERIA/0/101596)*

The specialist in terminological informatics utilizes computerized data management to build indexed cards, databases, and terminological banks, and to develop systems for accessing and retrieving data. Through computational tools, terminological data and systems are processed with

the goal of achieving multiple objectives, such as ease of use, speed of performance, and the storage of vast amounts of information. *(Om El-Sheikh Yahiaoui, 2010–2011)*

2.2. Computational Linguistics

2.2.1. Definition of Computational Linguistics

Computational linguistics is one of the branches of **applied linguistics** that makes use of **computer technology** to study various linguistic issues, such as analyzing linguistic phenomena across their levels — **phonetic, syntactic, rhetorical, and prosodic** — as well as conducting **statistical analyses**, **dictionary creation**, **machine translation**, and **language learning**.

This discipline is also known by several alternative terms, such as **computer linguistics**, **automatic linguistics**, and **information linguistics**. *(Abd al-Qadir Abd al-Jalil, 2002, p. 181)*

2.2.2. Levels of Computational Linguistics

Computational linguistics operates according to a specific methodological framework for studying linguistic facts and computational aspects involved in language processing and production. There are three abstract levels in computational linguistic study:

- **The Mechanism Level:**

Focuses on describing the **functions performed by the brain's physical components**.

- **The Algorithmic Level:**

Refers to the **description of the algorithm** that governs the activity of the system, allowing for numerous and unlimited

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possible configurations, depending on the computational design available.

- **The Computational Level:**

Represents the highest level of abstraction, where the goal is to analyze linguistic problems within the framework of information processing. At this stage, linguists use advanced systems and programs to computerize the Arabic language, converting all aspects of morphology, syntax, and vocabulary into digital form, thereby creating formal models that simulate Arabic mental processing. *(Ṣaliḥ Ghilous, p. 28)*

2.2.3. Computational Mechanisms for Building an Arabic Lexicon

- **Database Preparation:**

The lexical database is considered one of the most essential components that can be constructed using web-based applications. *(Fatima al-Zahra Abu Shadi, 2010, p. 18)*

The terminological database includes all the knowledge expressed in classical terminology banks, in addition to rich conceptual information. The structure of such a knowledge base must prevent ambiguity between linguistic and conceptual-semantic relations and provide a clear and concise description of the concepts within a specific field. *(Fatima al-Zahra Abu Shadi, 2010, p. 183)*

The **knowledge base** (*Knowledge Base*) is the **core of any knowledge system** (*Knowledge System*). Its construction requires **utmost precision**, as the specialist must **collect knowledge from various sources**, then **represent it** using specially designed **models for knowledge representation**.

Given the vastness and richness of **Arabic lexicons**, addressing this issue from the perspective of **knowledge systems** has become both **vital and necessary**. *(Raafat Al-Kamar, p. 154)*

One of the main problems of Arabic lexicography lies in poor organization and the difficulty of retrieval. Therefore, the designer of the knowledge base must ensure optimal structuring so that users can easily access the required data. This involves establishing relationships among lexical entries, linking them to the linguistic texts for which the lexicon was designed, and maintaining strong connections between all these components and the lexicographical knowledge integrated into the system. *(Raafat Al-Kamar, p. 154)*

In contrast, French computerized lexicons were developed based on cross-referenced referential systems that mirror human memory structures. Their design relies on organizing nouns, verbs, adjectives, and sources according to the specific type of lexicon being constructed, with methodological frameworks designed to reflect lexical awareness and conceptual coherence. *(Mohamed Zayed & Slim Misfar, 2018, p. 14)*

- **Preparing the Database:**

The database contained within the system's knowledge base includes the lexical items for which the dictionary is designed. The dictionary may be organized within this database according to the roots of words, the alphabetical order of entries, or their morphological patterns, based on a single morphological scheme, or according to the morphological structure to overcome problems of diacritization. Each working team may construct the

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database in the way that best suits its needs or matches the specific uses of that computerized dictionary. (Mohamed Zayed & Slim Mesfar, 2018, pp. 154–155)

Accordingly, a database for Arabic vocabulary should be built upon a theoretical and formal methodological framework, relying on a set of algorithms that generate derivations from roots and vice versa. One of the methodological constants of this model, at the syntactic level, is the limitation of basic syntactic structures to five core patterns derived from an original formal structure:

F S_0 K, where:

- **F** = verb (first constant)
- **S_0** = subject (second constant)
- **K** = sequence of objects in the sentence (K = 0, 1, 2 as variable) (Mohamed Mohamed Al-Habbash, p. 04)

Hence, building any database within a knowledge framework related to lexicography must rely on a code assigned to each lexical entry, which must be accurate, since the computer processes linguistic forms rather than their meanings. Therefore, it is necessary to assign the correct code to each entry; otherwise, confusion may occur in later processing (Mohamed Mohamed Al-Habbash, p. 06). It is thus crucial to encompass all morphological features of the lexical entry to avoid incomplete information for any given entry.

Model of Data Structuring in the Computational Dictionary:

Before hosting linguistically structured data and linking words syntactically and morphologically, the data go through a phase where a standardized model is followed.

This model ensures that data are built into a database accessible via standardized software interfaces—used for displaying, updating, retrieving, adding, or searching.
The standardized model includes several stages organized on two levels:

- The upper level defines the structural elements that contain standardized constants.
- The lower level specifies these constants as descriptive data.

As for lexical constants—such as gender and transitivity—stored in the data type registry, they are managed as general resources for the model. These constants are used to fill structural elements at the higher level. (Mohamed Zayed & Slim Mesfar, p. 15)

2.3. Organizing the Network of Relations:

This mechanism identifies the relationships linking dictionary entries, such as the relation between roots and words, their morphological forms, or semantic relationships like synonymy, polysemy, antonymy, and semantic fields. These relations improve search performance, optimize retrieval, and allow the extraction of specialized sub-dictionaries, such as dictionaries of idiomatic expressions, collocations, synonyms, and antonyms. (Hafedh Ismail Aloui & Abdelkader Al-Fassi Al-Fihri, 2014, p. 188)

2.4. Organizing Lexical Lists:

This refers to preparing the list of lexical entries and dictionary materials selected from text samples. These entries are alphabetically ordered, each assigned a specific numerical identifier for automatic recognition. The list is

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used to generate lexical statistics for verbs, nouns, adjectives, and plurals, as well as to prepare various indexes for each lexical item. (Hafedh Ismail Aloui & Abdelkader Al-Fassi Al-Fihri, 2014, p. 189)

2.5. Updating the Dictionary:

After creating the first version (core version) of the dictionary, a collaborative updating mechanism is proposed through the Internet, with centralized control over the acceptance or rejection of proposed entries (Ibrahim Al-Kharashi, p. 16). New lexical items can be added based on usage or the emergence of new terms as part of linguistic evolution. This process occurs collaboratively online, under the supervision of a database manager who reviews all proposed or added materials (Mourad Lougam, 2008, p. 12).

Completing a computational dictionary project requires continuous updating. Practically, this is achieved by releasing update versions on the dictionary's website, which users can download and install on their personal computers. This feature gives the Arabic computational dictionary a major advantage over traditional printed dictionaries, as it allows constant updates and access to the newest entries.

3. The Role of Computational Linguistics in Building a Specialized Economic Computational Dictionary

3.1. Determining the Sample:

Economics is considered one of the applied social sciences that relies on a vast and diverse terminological wealth, reflecting the variety of its fields and branches. Its terminology circulates between Standard Arabic and foreign

loanwords, often borrowed from multiple languages despite the existence of Arabic equivalents. Based on this, the present study selected a sample of 12 terms that are the most frequently used in general economics and, more specifically, in the banking sector.

Table (01): Most Commonly Used Terms in the Banking Sector

Single Terms	Compound Terms
bank, cheque, dinar, loan, share, financing, consolidation	exchange rate, bank cheque, money transfer, bank loans, capital, joint-stock company

All of the above are economic terms frequently used in financial and banking discourse.

3.2. Processing Phase:

In this stage, the economic terms are processed through the following steps:

a. Linguistic verification, identifying whether each term is of Arabic or foreign origin.
b. Distinguishing between derived, coined, Arabized, translated, and foreign terms.
c. Determining both the linguistic meaning and the terminological (technical) meaning.
d. Identifying the equivalent English term.

Example of Terminological Processing:

1. **Bank:**

   The term *bank* is a loanword of Persian origin, later integrated into Arabic through Italian mediation. It conforms to Arabic morphological rules, fitting the

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pattern فَعْل(fa‘l), with a fatḥa on the first radical and a sukūn on the second. The term originally referred to a table or counter used for currency exchange and money transactions, derived from the Italian *banco*, meaning *bench* or *counter*.

Since the word *bank* entered Arabic through adaptation and conforms to its phonological and morphological system, it is categorized as an Arabized term, denoted by the symbol **(مع)** (for *muʿarrab*).

Linguistically:

According to *Lisan al-ʿArab* by Ibn Manẓūr (1993), *al-bunk* means the root or essence of something. Arabs sometimes used the expression *raddahu ila binkat al-khabith* to mean “returned it to its origin.” Al-Azhari adds that *al-bunk* in Persian means *origin* or *foundation*, and the phrase *tabannaka fi al-makan* means “he settled in a place.” Thus, *tabannakū fi mawḍiʿ kadha* means “they stayed there.”

Hence, the lexical meaning points to *foundation or origin*, while the technical meaning in economics refers to a financial institution responsible for receiving deposits, granting loans, and conducting financial transactions.

According to *Al-Mu‘jam Al-Wasiṭ*, the word *bank* is defined as:

A financial institution that conducts credit operations through borrowing and lending.

(Academy of the Arabic Language, 2011, p. 586)

Terminologically:

The term *bank* in financial management refers to a financial institution or company whose activity consists in granting

credit to its clients—whether individuals, enterprises, or other organizations—as well as dealing in debts and engaging in various financial operations. (Fahmi Mahmoud Shukri, 2011, p. 388)

3.3. The Cheque:

The term *cheque* is a loanword that entered the Arabic language and conformed to its morphological rules. It is thus considered an Arabized term, denoted by the symbol (مع) (*muʿarrab*).

Linguistically:

> *A cheque is an order issued to a bank by a person holding an account, instructing the bank to pay, upon presentation, a specified sum of money to a designated person, to the order of a person, or to the bearer.* (Academy of the Arabic Language, 2011, p. 504)

Terminologically:

> *A cheque is a document drawn up according to the conditions stipulated by law, by which the drawer orders the drawee (usually a bank) to pay a certain amount of money to a third party or to the bearer (the beneficiary). It is always payable upon presentation.* (Ali Fettak, 2004, p. 14)

3.4. Financing:

The term *financing* is a genuine Arabic term, morphologically and semantically established in the Arabic lexicon. It is a verbal noun (maṣdar) derived from the verb موّلَ / يُموّلُ / تمويلاً, on the morphological pattern تفعيل(taf'il). It is, therefore, a derived term, symbolized as (م.ش) (*mushtaq*).

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Linguistically:
According to Abu al-Ḥasan Ahmad ibn Faris ibn Zakariyya al-Razi (1991), the root *m-w-l* carries the meaning of possessing wealth or acquiring money, as in the expression *tamaūwala al-rajul*, meaning "the man became wealthy."

Terminologically:
Financing refers to the provision of funds from various sources and the continuous and regular supply of capital to a company whenever the need arises—i.e., at the appropriate time. (Mahfouz Jabar, 2011, p. 38)

3.5. Exchange Rate:

The term *exchange rate* is an authentic Arabic expression found in the Arabic lexicon both in form and meaning. It is an *iḍafah* (genitive construction) composed of *siʿr* (price/rate) + *ṣarf* (exchange). The word *siʿr* is a verbal noun derived from the verb *saʿara*, following the pattern *fiʿl* (with a kasrah on the first letter and a sukun on the second). The word *ṣarf* is also a verbal noun derived from *ṣarafa*, following the pattern *faʿl* (with a fatḥah on the first letter and a sukun on the second).

- **Linguistically:** it refers to "the market price concerning the currencies of nations." (*Academy of the Arabic Language*, 2011, p. 430).
- **Terminologically:** it is the rate at which one currency is exchanged for another at a specific time and under specific conditions. It depends on the number of monetary units of a given currency that must be paid to obtain a certain unit of a foreign currency. (*Mohammed Ibrahim Al-Tuwaijri*, 1993, p. 41).

- **5. Dinar:**
- The term *dinar* is an Arabized term of Persian origin. It entered the Arabic language and conformed to its grammatical rules, including definiteness, dual, and plural forms: *dinar*, *dinaran*, and *dananir*. It is a singular noun with no verb form, used in commercial transactions as a coined currency of specific value. Since the term is Arabized, it is denoted by the symbol (مع).
- **Linguistically:** it was a gold coin whose value in the Islamic state equaled approximately fifty *qirsh*, and today it is the currency of some Arab countries, equivalent to the English pound at that time. (*Academy of the Arabic Language*, 2011, p. 289).
- **Terminologically:** it refers to a gold-minted currency, where the Islamic legal *dinar* weighs one *mithqal* of gold, equivalent to 4.25 grams. (*Ahmad Al-Sharbasi*, p. 164).

3.6. Capital:

The term *capital* (*raʾs al-mal*) is an authentic Arabic expression found in the lexicon both in form and meaning. It is an *iḍafah* construction formed from *raʾs* (head) + *mal* (money). *Raʾs* is a verbal noun derived from *raʾasa–yaraʾasu–maraʾūs*, following the pattern *faʿl* (with fatḥah on the first letter and sukun on the second). *Mal* is a verbal noun derived from *mala–yamilu*, following the pattern *faʿlun*. From a graphic perspective, the compound *raʾs al-mal* is often written as *raʾsmal* for technical purposes. Since it is composed of two words, it is symbolized as (م.ش) for *derived compound term*.

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- **Linguistically:** *raʾs* means the uppermost part of anything; its plural in paucity is *arʾus*, and in abundance *ruʾūs* (*Ibn Manẓūr*, 1993, p. 91). *Mal* means possessions or property; its plural is *amwal* (*Ibn Manẓūr*, 1993, p. 636).
- **Terminologically:** in capital-based companies, *capital* refers to the amount contributed by partners for investment and development. It represents human-made resources aiding in production, such as machinery, equipment, and buildings. (*Jamal Abdel Nasser*, p. 186).

3.7. Bank Loans:

- The term *bank loans* (*qurūd bankiyya*) is an authentic Arabic expression formed as a predicative construction from *qurūd* (loans) + *bankiyya* (banking). It blends an authentic Arabic element (*qurūd*) with an Arabized one (*bankiyya* from *bank*). The word *qurūd* is the plural of *qarḍ* (loan), a derived noun following the pattern *faʿl*. The adjective *bankiyya* derives from an Arabized noun and follows the pattern *faʿl*. Thus, since the term combines a derived and an Arabized component, it is classified as a *derived term* and symbolized (م.ش), given Arabic's derivational nature.
- **Linguistically:** see the definitions of *loan (qarḍ)* and *bank (bank)*.
- **Terminologically:** it refers to the services provided to clients whereby individuals, institutions, and entities are supplied with necessary funds under the condition that the borrower repays those funds, including interest and charges, either in one

installment or in agreed-upon payments on specific dates. This relationship is reinforced by mechanisms ensuring repayment without losses. (*Hasan Samir ʿAshish*, 2010, p. 58).

Constructing a Computational Economic Dictionary

After linguistically analyzing and verifying entries—distinguishing between authentic Arabic and Arabized terms—the following stages are identified:

1. **Planning the Dictionary:**
    - **Objective:** to facilitate the search for appropriate terminology for each banking operation.
    - **Clarify** and **eliminate ambiguity** in the explanation of terms.

Target Audience: beginners in the field, specialists, students, researchers, and banking sector employees.

2. **Collecting Dictionary Material:**

Entries were selected from the most frequently used economic terms in the banking sector.

3. **Nature of Entries:**

Includes both simple and compound nouns, classified as *derived* or *Arabized* as follows:

- **Derived Terms:** *loan*, *funding*, *exchange rate*, *localization*, *bank transfer*, *joint-stock company*.
- **Arabized Terms:** *bank*, *cheque*, *dinar*.

4. **Arranging Entries:**

The entries of the computational economic dictionary are organized alphabetically.

5. **Providing Definitions and Explanations:**

Each entry includes its **linguistic** and **terminological** meanings.

6. **Final Review:**

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A final verification of the dictionary's content.

Additional Computational Procedures

1. Develop suitable computer programs following the dictionary's design plan.
2. Conduct morphological analysis of words.
3. Provide usage information and contexts for each term.
4. Build a linguistic database.
5. Regularly update the dictionary.

Conclusion

A. Findings:

The research has led to several key findings summarized as follows:

1. **Computational linguistics** plays a significant role in lexicography in general and in the compilation of specialized dictionaries in particular. It aims both to **facilitate research and reading** and to **keep pace with technological advancement**.
2. The **computational economic dictionary** is built upon several linguistic levels — primarily **derived terms**, followed by **neo-coined**, **Arabized**, **foreign**, and **translated** terms.
3. The entries of the computational economic dictionary vary between **simple** and **compound** terms. The compound terms are structured according to different syntactic patterns, such as:
    - *Predicative construction* (subject–predicate),
    - *Descriptive construction* (noun + adjective), and

- *Genitive construction* (*iḍafah*).

4. Economic and banking terminology is used in two main forms: primarily **derived terms**, and secondarily **Arabized** ones. However, many foreign terms continue to be used in their original form despite existing Arabic equivalents, such as:
   - *bank* = *maṣrif*,
   - *cheque* = *ṣakk*,
   - *bank loans* = *maṣrifiyya loans*,
   - *bank cheque* = *ṣakk maṣrifi*.
5. Economic terminology exhibits a variety of **morphological patterns**, including *faʿl*, *mufaʿalah*, *faʿilah*, *fiʿal*, *faʿlun*, and others.

B. Recommendations:

To overcome the difficulties facing the development of both general and specialized dictionaries, the following recommendations are proposed:

1. **Linguistic academies** should give greater attention to the creation of **specialized computational dictionaries**.
2. **Old lexicons** should be utilized in the development of modern specialized dictionaries, as they contain valuable linguistic data that can enrich computational linguistic resources.
3. There is a need to **standardize banking terminology** through the creation of a **computational economic dictionary**.
4. **Arabic-derived terminology** should be preferred and employed instead of foreign or Arabized ones, even if the latter are widely used.

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5. It is recommended to **design a prototype (sample page)** of a computational economic dictionary aimed at **unifying banking terminology**.

Proposed Sample Page from a Bilingual (Arabic–English) Computational Economic Dictionary

Letter	**Term (Arabic)**	**Description (Translated into English)**	**Equivalent (English)**
B	**البنك**(*Al-Bank*): *Arabized noun, morphological pattern: fa'l.***Linguistically:** According to *Lisan al-ʿArab*, *al-bunk* means "the origin of a thing" or "its essence." Arabs used the term as a borrowed word, saying "raddahu ila binkati al-khabith," meaning "its origin." Al-Azhari adds that *al-bunk* in Persian means "origin," and "tabannaka" means "to settle in a place."**Terminologically:** In banking management, this term refers to a financial institution or company that grants credit to clients—individuals or	**Bank**	

	corporations—deals in debts, and performs various financial operations.		
F	**تمويل**(*Tamwil*): *Derived noun, morphological pattern: taf'il.***Linguistically:** From the root *m-w-l* (mim, waw, lam). It means "to acquire money"; "tamawwala al-rajul" means "to become wealthy."**Terminologicall y:** Financing refers to the provision of funds from various sources and their continuous and regular supply to a company whenever needed, that is, at the appropriate time.	**Finance**	
D	**توطين**(*Tawṭin*): *Derived noun, morphological pattern: taf'il.***Linguistically:** From the verb *waṭana* – "to settle in a place," meaning to take it as a home or residence.**Terminologicall y:** In commercial usage, *domiciliation* means assigning a specific bank name and account number for the payment of a negotiable instrument,	**Domiciliati on**	

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	designating a financial institution as the place of settlement.		
B	**حوالة مصرفية**(*Ḥawalah Maṣrafiyyah*): *Compound derived noun, patterns: faʿalah, mafʿaliyyah.***Linguistically:** Payment made to a beneficiary through any bank branch.**Terminologically:** Also known as *electronic transfer* or *bank transfer*, it is the process of transferring money electronically from one person to another or from one bank account to another.	**Bank Transfer**	
د	**دينار**(*Dinar*): *Singular Arabized noun, pattern: fiʿal.***Linguistically:** A gold coin that, in the Islamic state, was valued at about fifty piastres, and today serves as the currency of several Arab countries.**Terminologicall y:** A coined gold currency; the Islamic legal *dinar* weighed one *mithqal* of	**Dinar**	

	gold, equivalent to 4.25 grams.		
ر	رأس المال(*Ra'ṣ al-Mal*): *Compound derived noun, patterns: faʿl, faʿlun.***Linguistically:** *Ra'ṣ* means "the top of something," and *mal* means "that which is owned," plural *amwal* (from the root m-w-l).**Terminologically:** The amount of money contributed by partners for investment and used in producing resources such as machines, equipment, and buildings.	**Capital**	
E	سعر الصرف(*Siʿr al-Ṣarf*): *Compound derived noun, morphological forms: fiʿl, faʿlun.***Linguistically:** Refers to the market price of the currencies of nations.**Terminologically:** The rate at which one currency is exchanged for another at a specific time and under certain conditions. It depends on the number of monetary units of one currency	**Exchange Rate**	

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	required to obtain one unit of a foreign currency.		
C	**الشيك**(*Al-Shik*): *Singular Arabized noun, pattern: fiʿl.***Linguistically:** An order issued to a bank by a person who has an account there, instructing it to pay a certain amount to a specific person or bearer upon presentation.**Terminologically:** A written instrument prepared according to legal conditions, by which the drawer orders the drawee to pay a specified amount to a third party or the bearer upon presentation.	**Cheque / Check**	

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