



Research on the development and innovation of modern information technology in the linguistic perspective.

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RESEARCH ON DEVELOPMENT AND INNOVATION OF INFORMATION TECHNOLOGY IN THE LINGUISTIC PERSPECTIVE

***Abstract:** Many human inventions have made the society more developed, which changed numerous aspects of life and language today. The topic "Research on development and innovation of information technology in a linguistic perspective" deserves to be researched in the period of innovation and globalization to meet the increasing need of current society nowadays. To accomplish this topic, we have used statistical methods, classification, description and synthesis. Based on the number of information technology terms collected, we conducted a description in order to summarize their structural and semantic characteristics. In addition, we also conducted in-depth analysis and explanations to provide applications in education, which would be valuable material for linguistics and information technology research.*

Key words: Development, innovation, information technology, linguistics perspective,...

1. INTRODUCTION

Since the half of the 20th century, in the 1990s, there has been a tremendous growth in Information Technology in various countries, specially in developed country, becoming the largest and fastest growing industry. Along with the global spread of information technology revolutions, other new high-tech industries such as biology, new materials, new energy sources, aerospace and so on. have been developing significantly. In the Resolution of the Eighth National Congress of Party in Vietnam was affirmed that "From now till 2020, we must strive to build our country basically to become an industrial country; science and technology must become the foundation and driving force for industrialization and modernization of the country". The Resolution emphasized "Application of information technology in all fields of national

economy, creating a clear change in productivity, quality and efficiency; forming the national information network linking with some international information networks ... ". The Resolution also stated that the guiding points of view should be thorough "Together with education and training, science and technology are the top national policies, the driving force for social and technological development, and the necessary conditions for national independence and the construction of socialist success. Industrialization and modernization of the country must be equal and based on science and technology. Party and Government have investment policies to encourage and support the development of science and technology". And to meet the increasing social needs and requirement for scientific and technological level of each nation, it is also crucial for the self-improvement of each individual accordingly. Therefore, the topic "Research on the development and innovation of modern information technology from a linguistic perspective" is topical and prominent issue that deserves to be researched the cutting edge of fast-paced information technology.

2. CONTENT

2.1. Issues related to the topic

2.1.1. *Concept of technology, information technology*

According to the Wikipedia Dictionary, "Technology is the invention, change, use, and knowledge of tools, machines, techniques, skills for job, systems, and organizational methods, solving a problem, improving an existing solution, achieving a goal, or performing a specific function. Technology can also be a collection of such tools, including machines, arrangements or processes. Technology significantly affects the ability of humans and other animals to control and adapt to their natural environment. The term may be used in a general sense or for specific fields, such as information technology, etc. ".

Information technology is considered a science that is officially integrated into the school curriculum in Western education systems and several developed countries. In Vietnam, the concept of Information Technology is understood and defined in the Government's Resolution 49/ CP signed on August 4th, 1993: "Information technology is a collection of scientific methods, modern means and technical tools - mainly computer and telecommunication techniques - in order to organize the efficient exploitation and use of resources. Very rich and potential information in all areas of human and social activities". Information Technology (IT) is an application of information processing and management technology. Information Technology is the industry that uses computers and computer software to convert, store, protect, process, transmit, and collect

information. People working in this industry are often called Information Technology Specialist (IT specialist). With the advent of the Internet, broadband connections to all schools, the application of knowledge, skills, and understanding of Information Technology in subjects have become reality.

2.1.2. History of development and innovation in technology and information technology

Humans began to use technology when converting natural resources into simple tools. The discovery of prehistoric fire control increased the source of food and the invention of the wheel to enable people to travel and control their habitats. Recent technological developments, including printing technology, telephones, and the Internet, have reduced physical barriers in communication and allowed access to free-charge interaction and calls globally. However, not all technologies are used for peaceful purposes; The proliferation of weapons with ever-increasing destructive power has taken place throughout history, from batons to nuclear weapons. Technology has an impact on society and its surroundings in some ways. In many societies, technology has helped create highly developed economies (including today's global economy) and a wealthy class has since emerged. Many technological processes produce unwanted by-products, such as pollution, depletion of natural resources and devastating the natural environment of the Earth. Different technological applications impact social values and new technology often involves new ethical issues.

Each technology includes the main components of equipment, human, with the knowledge, skills, creativity, experience,... and information includes technical data, specifications, people and organizations, equipment operation data to maintain, maintain, improve and design parts of the engineering section,...

2.2. Information technology development and innovation from a linguistic perspective

2.2.1. Beneficial activities of information technology

a. Math, Science and Technology

The ratio of science and technology are related to the technical development and design of products including the application of natural scientific knowledge.

Problems arising from the fields of technical design, processing of experimental data, etc. often lead to very large volumes of numerical calculations. Without using a calculator, those calculations cannot be performed in the time when allowed. Thanks to computers, designers can not only calculate many options, but also show them visually on screen or on paper. For example: Designing houses, cars, planes, streets, parks, graphic designs, logo designs,

banner designs,... with computer software such as Photoshop (Photoshop is heavily used to design graphic design, image editing, drawings, works ...); AutoCAD (AutoCAD is used to design 2D and 3D graphics, support design commands, quickly set up drawings, save drawings, have direct printing features, and use with many parts. other soft ...); CorelDRAW (CorelDRAW is used a lot to create unique technical drawings, Web site design, supports multiple images, fonts, templates, frames, features for coloring objects, previewing drawings when printing or exporting a file); Adobe Illustrator (Adobe Illustrator is used to design, illustrate, draw movies, design books, logos, leaflets, cartoons... but the main feature of Adobe Illustrator is gradients, create patterns, transform convert bitmap images to vector...); Adobe InDesign (Adobe InDesign is commonly used to design print documents, design documents, etc.) But professional designers and publishers use Adobe InDesign to create books more professionally than Adobe Illustrator. Because they are Adobe products, we can easily combine InDesign and Illustrator to use graphic design ...). Thanks to these software, the design process becomes faster, more complete and especially, lower costs than previous designs.

b. Supporting the management

It can be said that any organized human activity needs to be managed. Management activities have a common feature of handling large amounts of information and that information is often very diverse. For example, specialized software of Microsoft Excel, Microsoft Word, Quattro, Powerpoint, SQL Server, MS Visual Foxpro, DBase, DB2, Paradox, Sybase ... (SQL = Structure Query Language, which only works with data that has Table structure such as Foxpro, DBase, Access ... SQL is even more important, it is used to quickly create dynamic Web pages (Dynamic Web Page). SQL content can be used as a glue between the database and the Web. When the user requests it, SQL will perform access to the information in the database on the server and display the results on the Web page). The management activities have a common feature that they have to handle a number of information and manage warehouses, supplies, groceries, personnel records management, management activities in offices, libraries, hospitals, schools,... by the software vnishurex [<https://k6avb2.wordpress.com/2008/06/06/vnishurex-2008-%E1%BB%A9ng-d%E1%BB%A5ng-h%E1%BB%93-s%C6%A1-qu%E1%BA%A3n-li-h%E1%BB%93-s%C6%A1-nhan-s%E1%BB%B1/>], SINNOVA-HRMS [<https://www.sinnovasoftware.com/userfiles/download/sinnova-hrms.pdf>],...

c. Automation and control

With the help of computers, people have flexible, precise, low-cost, efficient and diverse automation technology processes. Information technology helps automate the manufacturing process (automation of machine manufacturing, mechanical engineering, robot manufacturing, auto assembly, petroleum, textile, metallurgy, chemistry, cement, food processing), designing and operating automatic systems, automatic production lines at factories (cement, steel, beverage, pharmaceuticals,...); automation control in product management at domestic and foreign companies dealing in automatic electronic devices,...

d. Media

Media is not just a process of sharing information. The communication processes in most cases are mediated signs-mediated interactions. Three levels of signaling rule dominate communications processes: syntax, pragmatic, and semantics. For example, the Vlookup function (Vlookup is a function to look up data in Excel, use the Vlookup function when you need to find everything in a table or a range by row); the Pascal function (Pascal is a low-level programming language that is quite popular in the world and is often included in the curriculum of computer science in secondary school - high school). Variable in Pascal is placed in a block starting with the var keyword, followed by variable definitions such as var (A_Variable, B_Variable ...: Variable_Type). Pascal variables are declared inside the code section of the function, the Function/ Procedure. In Pascal, an established procedure of instructions will be executed, with no return values and a function as a procedure with return values. Function Func_Name (params ...): Return_Value; Proc_Name procedure (params ...); Comment multiple lines enclosed in braces and asterisks * to { * ... * }. Pascal allows comments 1 line enclosed in braces {...}, { * This is a multi-line comment and will span multiple lines. * }, { This is a single-line comment in pascal }. Case Sensitivity, the Pascal programming language is not case-sensitive, meaning you can write variables, functions, and procedures in both uppercase and lowercase. Such variables as A_Variable, a_variable and A_VARIABLE are all meaningful in Pascal; Pascal statements (Pascal programs are created from instructions. Each instruction identifies a specific task of the program. These tasks can be declared, assigned, read data, written data, converted. program control, ...), eg. readln (a, b, c); s := (a + b + c) / 2.0; area := sqrt (s * (s - a) * (s-b) * (s-c)); writeln (area). Pascal Exclusive Keywords: The commands in Pascal are designed with a number of specific Pascal keywords, called reserved keywords (reserved word). Such as word (keyword), program (program), input (input), output (output), var, real, begin,

readline, writeline and end are all reserved keywords in Pascal. The word and symbol in pascal are usually a set of Pascal Characters and Identifiers including all uppercase letters (AZ), all lowercase letters (az), all digits (0-9), and special symbols - + * /: = ,. ; () [] = { } space. Entities in a Pascal program like variables and constants, types, functions, procedures, and records,... will have a name or an identifier. Identifier is a sequence of letters and numbers, starting with a letter. Special symbols and spaces are not used in the identifier.

Or JavaScript function (JavaScript is a programming language of HTML and the Web). It is lightweight and most commonly used as part of web pages, whose implementation allows the Client-Side script to interact with the user and create dynamic web pages. It is an interpreter programming language with object-oriented capabilities. JavaScript was first known as Mocha, and later LiveScript, but the Netscape company changed its name to JavaScript, because of its popularity as a Java phenomenon at the time. JavaScript first appeared in Netscape 2.0 in 1995 as LiveScript. The versatile core of this language has been embedded in Netscape, IE, and other browsers. According to the ECMA-262 Specification defining a standard version of the JavaScript language, "JavaScript is a lightweight, interpreted programming language; Designed to create central network applications; complements and integrates with Java, complements and integrates with HTML; Open and cross platform" [<https://quantrimang.com/javascript-la-gi-155978>]. JavaScript syntax can be done using JavaScript commands that are placed within the HTML `<script> ... </script>` tags in a web page. You can place your `<script>` tags, containing your JavaScript, anywhere on your page, but it is recommended that you keep them in your `<head>` tags. The `<script>` tag tells the browser to start translating all the text between these tags as a script. A simple JavaScript syntax will appear `<script ...> JavaScript code </script>`. The script tag takes two important properties about language (this attribute determines which scripting language you are using. Its value will be javascript. Although recent versions of HTML (and XHTML) have been phased out. do not use this attribute anymore). And type (this attribute is what is now recommended to use and its value should be set to "text / javascript"). For example: `<script language = "javascript" type = "text / javascript"> JavaScript code </script>`.

Besides, the computer also has syntax errors in the computer language (syntax error, unexpected 'private', for example, when you enter a formula with incorrect syntax in a cell in the Excel operating system's Excel application software, you'll see #VALUE displayed in the cell, which doesn't explicitly indicate a syntax error, but it is indeed; or you can break a lot of rules in HTML

and a web page will remain display well in most browsers. The problem can become unpredictable. A page may look fine on your browser, but not in someone else's browser. You should check your code with the W3C authentication service, which provides detailed information about errors in HTML code; or if there is a syntax error in JavaScript, it will prevent the thread (thread) from running. However, the rest of the code, contained in other threads, will still be executed, as long as they are independent of the faulty thread. When running code in the browser, usually nothing happens. You will not receive an error message and the code will not run.

If your code fails due to syntax errors, there are some things you can do to debug your code, then you need to find out exactly where the syntax error is. In many languages, you will receive detailed error messages, telling you where the error is in the code. If you know which instructions contain errors, you can check the documentation for examples of correct syntax; Or if you're not sure where the problem is, you can try dividing the code into smaller parts, see if each part works properly, and determine which contains the error. Repeating this process can identify where the problem is and fix it; or if you need to debug lots of web code, it might be worth considering using developer tools.

Information technology has contributed significantly to the innovation of communication technology services. Nowadays, an inevitable trend is the connection of communication networks and computer networks, global internet, and thanks to so many other development services such as e-commerce, e-training, e-learning... which access the treasure trove of human knowledge resources easily.

e. Drafting, printing, archiving, office

With the help of other word processing and word processing programs such as Microsoft Word, Adobe-Photoshop, etc...and print media attached to computers and information technology have made tasks such as preparing administrative documents, reports, working schedules, class schedules,... become easier. in the past, you wanted a page of typed text, you had to sit down typing on an old typewriter and if you had typed it wrongly, you would have to start over. Nowadays there is no more with specialized software, you can easily edit yours until you are satisfied and then print.

f. Artificial intelligence

Artificial intelligence, or artificial intelligence, is the intelligence represented by any artificial system. The term is often used to refer to computers with an unspecified purpose and the science of theories and applications of artificial intelligence. This is a promising field of information technology such as

computers, laptops, translators, diagnostic ultrasound machines, handwriting recognition systems, voices and images... In the last few years, there have been quite a number of successful robots designed to serve human which is Japanese's ASIMO Robot. ASIMO stands for Advanced Step in Innovative Mobility. ASIMO robots are created by Honda Group engineers who have been working hard on creating, researching and testing successfully for 20 years on robots. In the end, they gave their new product that were supposed to be most similar to human, ASIMO robot. "ASIMO is the first robot in the world capable of climbing stairs and moving independently. It not only can recognize faces, voices, gestures but also can be controlled via voice. With your hands, ASIMO Robot can turn on and off light switches, open doors, carry something, push cars,... and countless other unnamed jobs. Honda Group engineers designed ASIMO Robot with the helping purpose to humans. Their robots that can do chores, take care of the elderly, and help the disabled in daily life. ASIMO robot is only tall about 1.3 meters, exactly the height of a person in a wheelchair, along with a similar appearance to a tiny astronaut, this makes the image of ASIMO Robot quite friendly and approachable. In addition, ASIMO robots are also designed to do things that are too dangerous for humans such as exploration in dangerous areas, bombs and mines,... ". [<https://genk.vn/kham-pha/asimo-niem-tu-hao-cong-nghe-nhat-ban-20111122104035736.chn>].

2.2.2. The role of Information Technology with the development of economy

According to britannica.com, "Technological development can also provide a distinctive trade advantage. The relatively advanced countries - particularly the United States, Japan, and those of western Europe - have been the principal exporters of high-technology products such as computers and precision machinery. One important aspect of technology is that it can change rapidly. This is perhaps most obvious in the computer field, where productivity has increased and costs have fallen sharply since the early 1960s (see Moore's law). Such rapid changes present several challenges for countries that are not in the front rank, it raises the question of whether they should import high-technology products or attempt to enter the circle of the most advanced nations. For the countries that have held the technological lead in the past, there is always the possibility that they will be overtaken by newcomers. This occurred in the second half of the 20th century when Japan advanced technologically in its automobile production to the point where it could challenge the automobile leadership of North America and Europe. Japan quickly became the world's foremost producer of automobiles, and by the end of the 20th century, Korean

automakers were attempting to follow the Japanese example with the aggressive export of automobiles. Technological advances also strengthen global trade in a general sense: e-commerce (electronic commerce), for example, reduced the impact of geographic distance by facilitating fast, efficient, real-time ties between businesses and individuals around the world. Indeed, at the end of the 20th century, information technology, an industry that scarcely existed 20 years earlier, exceeded the combined world trade in agriculture, automobiles, and textiles” [<https://www.britannica.com/topic/international-trade/Sources-of-comparative-advantage>].

The role of information technology and Microsoft Corporation in the development of economies, Information Technology is the driving force to promote economic growth and stimulate the growth of innovation for the global economy in general and the national economy of each country in particular. The development of IT has created a series of new industries with high added value, has trained millions of skilled IT workers; creating a huge revenue for the State budget, from collecting taxes (tens of billion dollars each year). Only in the field of programming guarantee in 1996-1997, each year Microsoft Corporation has paid taxes to the budget of countries around the world 28 billion USD, of which in the US is 7 billion USD, in Other countries is 21 billion USD. In 2001, taxes collected from Information Technology in countries (except the USA) were US \$ 34 billion and according to US Department of Commerce data, the share of the computer and telecommunications industry in the second half of the 1990s contributing to 1/3 of the superpower's economic growth.

The role of the Government, the State agencies play a very important role in supporting the IT field, through the legal provisions. In the scope of using IT, Microsoft Corporation aims to support the State agencies and economies of all countries in the world, in order to improve labor productivity, create jobs and stimulate development. economy. Governments can support these efforts, including measures such as enacting and ensuring strict compliance with intellectual property rights, investing in IT training, and opening up competition in telecommunication market, funding to support the commercialization of research and development results of international trade in goods and services of information technology, developing flexible capital market ... Nowadays, IT has brought efficiency to the economies of many countries. The potential of IT for stimulating economic development is enormous.

2.2.3. Development and renewal of modern technology associated with Vietnamese culture

a. Some cultural features

Culture is a concept understood in many different meanings based on different perspectives, it expresses the process and level of human awareness in a certain period of historical development.

According to author Hoang Phe wrote in *Vietnamese Dictionary* “In general, the material and spiritual values created by man in the historical process such as the treasure of national culture, Eastern culture, ancient culture; human activities to satisfy the spiritual life (in general): Economic and cultural development, mass cultural work; knowledge, scientific knowledge (in general): Studying culture, cultural level; high level in social activities, expressions of civilization: Cultural living, speaking without culture; groups of relics from the past (from ancient history period), have the same characteristics: Ax shoulder culture, color pottery culture ” [1988, pp.1135].

According to Ho Chi Minh, "culture is the combination of all modes of life and the manifestations that man has produced to adapt to the life needs and the demands of survival" [1995, pp.431]. The author Tran Ngoc Them also asserted: “Culture is an organic system of human and material values created and accumulated through practical activities, in the interaction between people and natural environment and social environment” [1995, pp.27]. In addition, the concept of culture has been mentioned by other authors such as Huu Dat, Nguyen Thi Kim Ngoc ... In summary, culture is a long process of formation and development, in each history of human and social results, material and social achievement.

In fact, the development and innovation of information technology has been changing us. All you need to do is sit down with your computer connected to the internet to do everything from work to apply for a new job, online shopping, study by e-learning, and contact with relatives all over the world, entertainment... Especially technology has helped people solve problems well thanks to the development of multimedia. The development and innovation of information technology has been a change in people's opinion, consciousness and behavior. For example, in education and training was mentioned nearly half a century ago and is considered as the training philosophy of Industrial Revolution 3.0 with computer equipment, internet, social networks facebook, zalo... In Revolution 4.0 with the core of IT - Automation and Artificial Intelligence, besides liberal education towards integration in training orientation such as STEM integrated education (including interdisciplinary knowledge in the fields of (Science, Technology, Engineering and Math) and develop sustainably in innovation with 4 basic characteristics: Inovation, Digital Factor, Research Factor and output standards are Innovators and

Entrepreneurs. This is the most important output standard of educational training programs in the Industrial Revolution 4.0 era.

3. CONCLUSION

In general, depending on the operating model of each agency, company or associated individuals, information technology has the appropriate service and use functions. The development and change of information technology has been affecting many developments in all fields from natural sciences, economics... to education, culture, society ... of every country in the world. Therefore, in order to meet the increasing demands of Vietnam as well as other developing countries in the period of regional and global integration, the state and the government in each country should pay attention to invest a lot of money in information technology development and innovation as well as intellectual training and human awareness in the process of national construction and development.

Up to now, information technology in our country has been developing strongly, not only contributing to promoting the cause of industrialization and modernization of the country, but also becoming a key economic sector. In accordance with the judgment of Deputy Prime Minister Nguyen Thien Nhan at the National Conference on Information and Communication Technology (ICT) in 2010, summarizing 10 years of implementing Directive 58-CT/TW of the Vietnamese Politburo and Deploying the "Project of making Vietnam become a strong country in ICT" on December 3 in Hanoi, Vietnam is "In the next 10 years, the ICT industry will become a key economic sector, contributing approximately 10% of the national GDP and training 1 million high quality human resources". The Deputy Prime Minister said that the ICT industry in Vietnam should focus on three breakthrough points: on state management; focus on developing national enterprises and information technology products; human resource development. And step by step meeting the development orientation of information and communication technology in the 2011-2020 period, the Ministry of Post and Telematics of Vietnam has issued Directive No. 07/CT-BCVT on "Strategic Orientation for Public Development of Vietnam information and communication technology in the period of 2011-2020" or "Take-off strategy" is "Bring Vietnam out of underdevelopment; creating a foundation for Vietnam to become basically an industrialized country towards modernization by 2020, successfully implementing the cause of industrialization and modernization associated with the development of the knowledge-based economy quickly".

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