

Enhancing Operational Efficiency Of Information Technology Systems: The Experience Of Saigon Union Company, Vietnam

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Abstract

Nowadays Information Technology (It) Has Helped The Industries To Deal With The Challenges When New Economy Poses. Moreover, Institutions Rely On It Gathering, Processing, Analysing, And Providing Information And Services In Order To Meet The Customers' Need. The Analysis And Processing Of Information In Organizations In General And Enterprises In Particular Need To Be Accurate And Timely To Support Decision-Making As Well As Management And Planning Of The Management Board. The Operation And Use Of Information Systems (Is) To Replace The Traditional Information Management Methods In Many Businesses Is No Longer A New Thing. Digitalization Of Products And Services Is A Fast-Moving, Global Megatrend That Is Fundamentally Changing Existing Value Chains Across Industries And Public Sectors. Modern Wireless Internet-Based Technologies With Real-Time Data Analysis Are The Common Tools Of Digital Applications To Provide Organizations With Great Business Improvements. The Topic "Enhancing Operational Efficiency Of Information Technology Systems: The Experience Of Saigon Union Company, Vietnam" Is Conducted To Evaluate The Factors Affecting The Improvement Of The Operational Efficiency Of It Systems For Saigon Union, Vietnam. The Target Of Is/It System Is Always Closely Linked With The Goals Of The Business. It Can Be Said That The Is/It System Is An Effective Tool Create Brand Value And Optimal Competitive Position In The Market Not Only In Vietnam But Also In International Markets. Especially During The Covid-19 Epidemic, Enhancing Operational Efficiency Of It System Is One Of The Effective Solutions To Enhance The Competitiveness Of Saigon Union.

Keywords: Information Technology, Information Systems, Enhance Operational Efficiency Of It Systems.

I. Introduction

Today In Many Fields Of Economy, It Has Played A Very Important Role. Unlike Other Industries, The It Industry Is Extremely Large, And Is An Industry That Develops So Quickly That Each Passing Day Is Likely To Be Obsolete Compared To The Day Before. Hardware Devices Are Increasingly Mobile, The Speed Is Faster And The Price Is Cheaper. Software More And More Vendors, Prices Are Also More Competitive. High Speed Network Services (4g, 5g) And Emerging Information Technologies (Eit) Such As Artificial Intelligence (Ai), Internet Of Things (Iot), And Big Data Are Increasingly Being Used.

From Traditional Whiteboard Teaching To Computer Presentation, Handwritten Correspondence To Email, Traditional Business To E-Business, And It's Easy For Everyone To Connect With Each Other On Facebook, Twitter... Everywhere Has Smartphones Even They Don't Have Computers. In Particular, The Is Play A Huge Role In Helping Businesses Develop And Create A Position In The Market. In Developed Countries They Have Applied A Lot Of Management Information System (Mis) For Businesses. However, The Application Situation In Vietnam Is Still Very Limited And Not Even Used. It Is Worth Mentioning That It Is Still Not Trusted By Users, Experts And Enterprises. Whether Businesses Build Their Own Is/It Systems Or Use Services Provided By Other Companies. With Consideration Of Cost, Features, Industry And Company Size, How Effective Is The Application Of It Into Mis And Enhances Operational Efficiency.



Figure 1: Information Technology & Management Information System

Thus, Certainly Throughout The Viet Nam, Even In Small Towns, Firms Feel The Pressure Of All Over The Country And Even Around The World. Enterprises Today Want To Develop, Expand, Certainly Indispensable For The Support Of The It Industry In Creating Websites, Advertising, Managing People, Making Profits. Besides, System Issues, Challenges, Constraints And Enforcement Policies In Implementing Is For Businesses Have Not Aimed At Improving Competitiveness, Not Consistent With The Actual Needs Of The Enterprise, And Not Interested By Businesses. This Is Mainly Due To The Lack Of Business Research, National Investment, And A Lack Of Vision For Global Competition.

Along With The Trend Of E-Government Development, Mandatory Digital Transformation, Any Enterprise Will Have A Need To A Timely Interest And Understanding Of The Importance Of Promoting Digitalization And Technology Application In Economic, Educational And Social Development, Medical, Etc. Of The State. Even Today's Smallest Businesses Routinely Serve Not Only Domestic But Also Global Customers And Achieve Competitive Advantage As Well As Economic Efficiency. Therefore, In Performing An Is/It Systems Analysis, We Must Evaluate The Scope, Magnitude, And Nature Of What Enterprise Is Doing Domestic And Globally Compared To Rival Firms.

To Assist In The Construction Quality Control Of The Ministry Of Construction (Moc), The Tasks Of State Agencies Such As State Authority For Construction Quality Inspection And Vietnam Network Of Bodies For Assessing Construction Quality Conformity Are Extremely Important. According To Incomplete Statistics, At Present, The Country Has More Than 2000 Construction Testing Laboratories (Ctl), Hundreds Of Organizations Operating In The Verification And Certification Of Conformity On Construction Quality. Experimental Activities Of Ctl Have Been Strictly Controlled By The State Through Inspection And Recognition Of Las-Xd Code. However, Construction Quality Inspection And Certification Organizations Have Not Been Fully Controlled. Enhancing Operational Efficiency Of It System Helps Saigon Union To Grasp The Government Support As Well As The Trend Of Society.

Besides, Covid-19, The "Storm" That Appeared Over The Past Year Has Covered The Global Economy In A Dark Gray. During Covid-19 Epidemic, The It Market As Well As The Demand For It Industry Had Many Positive Changes. Businesses Actively Seek It Solutions To Respond To Circumstances Rather Than Passively React To It. The Need Of Applying Is Will Be Increasingly Higher In Both Quantity And Quality. Especially, In The Growing Markets Like Vietnam, The Rising Demand Will Be The Biggest Growth Motivation. Assessment Of The Overall Vietnam Construction Testing Market After Covid-19 As Well As The It Needs Of Enterprises Is Of Urgent Significance. In Addition, The Working Culture Of Enterprises During The Covid-19 Pandemic Has Also Changed. Employees' Working Environment Management, Such As Working From Home And Working At The Company, Is Also Different From Before.

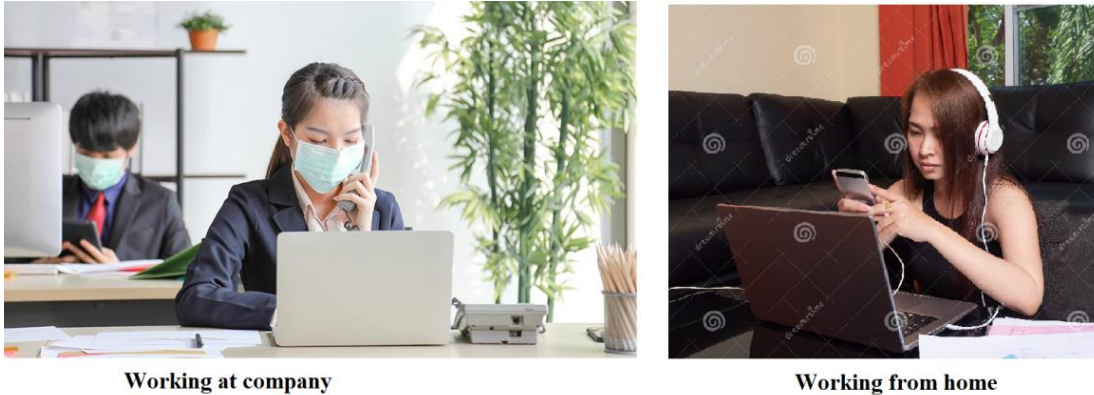


Figure 1: Working Environment

In Order To Enhance Operation Efficiency, Saigon Union Has Too Much To Do, Especially It Systems Since All Operations Of The Enterprises Were Computerized. There Are Many Obstacles And Difficulties For It Team To Complete In The Short Time Digitizing. However, There Were Many Issues Arising From The Digitalization In It System In Term Of Strategy, Operation And Technology. With All Economic And Societal Sectors Being Affected By Emerging Technologies, The Digital Economy Is Highly Volatile, Uncertain, Complex, And Ambiguous (Vuca). It Is Important To Take Responsibility For Recognizing The Many Issues That Are Needed To Enhance The Operational Efficiency Of It System.

The Advantages Of Using It In Business Can Compensate The Disadvantages Of Enterprises To Gain Competitive Advantage. The Key In A Competitive Strategy Is That Efficiency And The Nature Of The Operation Can Be An Important Component Of The Plan's Overall Effectiveness. Whether The Application Of It Really Brings Benefit Such As Reduce Cost; Encourage Information Exchange; Increase Quality Construction Testing Services; Saving Time And Effort; Help With Covid-19 Issue; Improve Staffs Outcomes For Saigon Union Has Prompted Me To Research And Discuss This Topic In Order To Enhancing Operational Efficiency Of It Systems.

II. Literature Review

2.1. Information Technology

There Are Many Definitions Of It But Cannot Be Defined Precisely Because The It Industry Is Very Broad. Some Definitions Are Shown:

Information Technology (It) Is The Use Of Computers To Store, Retrieve, Transmit, And Manipulate Data Or Information. It Is Typically Used Within The Context Of Business Operations As Opposed To Personal Or Entertainment Technologies. It Is Considered To Be A Subset Of Information And Communications Technology (Ict). An It System Is Generally An Information System, A Communications System, Or, More Specifically Speaking, A Computer System – Including All Hardware, Software, And Peripheral Equipment – Operated By A Limited Group Of It Users (Wikipedia, 2021).

Information Technology (It) Is The Use Of Any Computers, Storage, Networking And Other Physical Devices, Infrastructure And Processes To Create, Process, Store, Secure And Exchange All Forms Of Electronic Data. Typically, It Is Used In The Context Of Business Operations, As Opposed To Technology Used For Personal Or Entertainment Purposes. The Commercial Use Of It Encompasses Both Computer Technology And Telecommunications (Castagna, 2021).

Information Technology (It) Means The Use Of Hardware, Software, Services, And Supporting Infrastructure To Manage And Deliver Information Using Voice, Data, And Video (Dakota, 2021).

The Role Of The It Industry In Life: (1) Helping People Connect With Each Other More Easily; (2) Making The Use Of Money More Convenient; (3) Making Learning More Exciting; (4) Help Produce Many New Jobs.

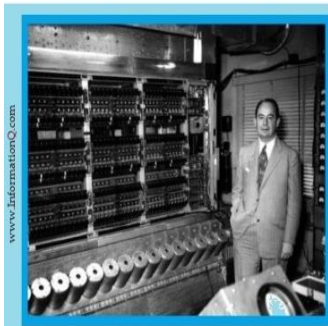
All Computers Are Systems Of Input, Processing, Output, Storage, And Control Components. By Increasing The New Technologies, Computers Are Becoming Cheaper, Smaller Which Increases The Buying Of Users. In The Early 80's, It Is Impossible To Find The Home Who Had The Computer. This Scenario Has Changed

Dramatically By The Many Latest Technology Improvements In Hardware, Software, And Most Homes Have Computers Such As Desktop Or Laptop Or Tablet. Lets Us Begin With The First Generations Of Computers To Future Computer (INFORAMTIONQ, 2018).

Generations of Computers and Future Computer

Fourth Generation of Computers. (1972-1980)

The Fourth Generation of Computers are comes with VLSI also we can call it as microprocessors.



First Generation of Computers. (1946- 1959)

The first generation of computer is introduced in 1946.

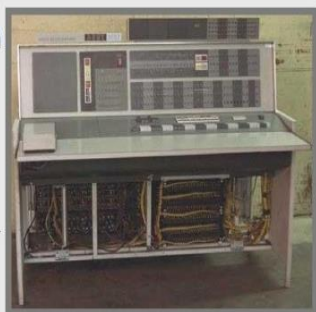


Fifth Generation of Computers. (1982- Present)

Now we use the Fifth Generation of Computers which were started around 1982.

Second Generation of Computers. (1959-1965)

The Second Generation of Computer uses the transistor in the place of vacuum tubes.



Sixth Generation of Computers.

The Sixth Generation of computers is different from, other generation computers in terms of size, speed and tasks that perform.



Third Generation of Computers. (1965-1972)

The second generation of computers uses the transistors in the place of vacuum tubes.



Future Generation of Computers.

In Today's Computer, we touch everything virtually. But, the future computers may be neurons and attains the human level intelligence.

Figure 3: Generations Of Computers And Future Computer

Software Is The General Term For The Different Types Of Programs Used To Operate And Manipulate Computers And Their Peripheral Devices. There Are Many Types And Categories Of Software. The Type Of

Software (See Figure 4) You Will Encounter Depends Largely On The Type Of Computer And Network You Use, As Well As The Specific Tasks You Want To Accomplish (Marakas, n.d.).

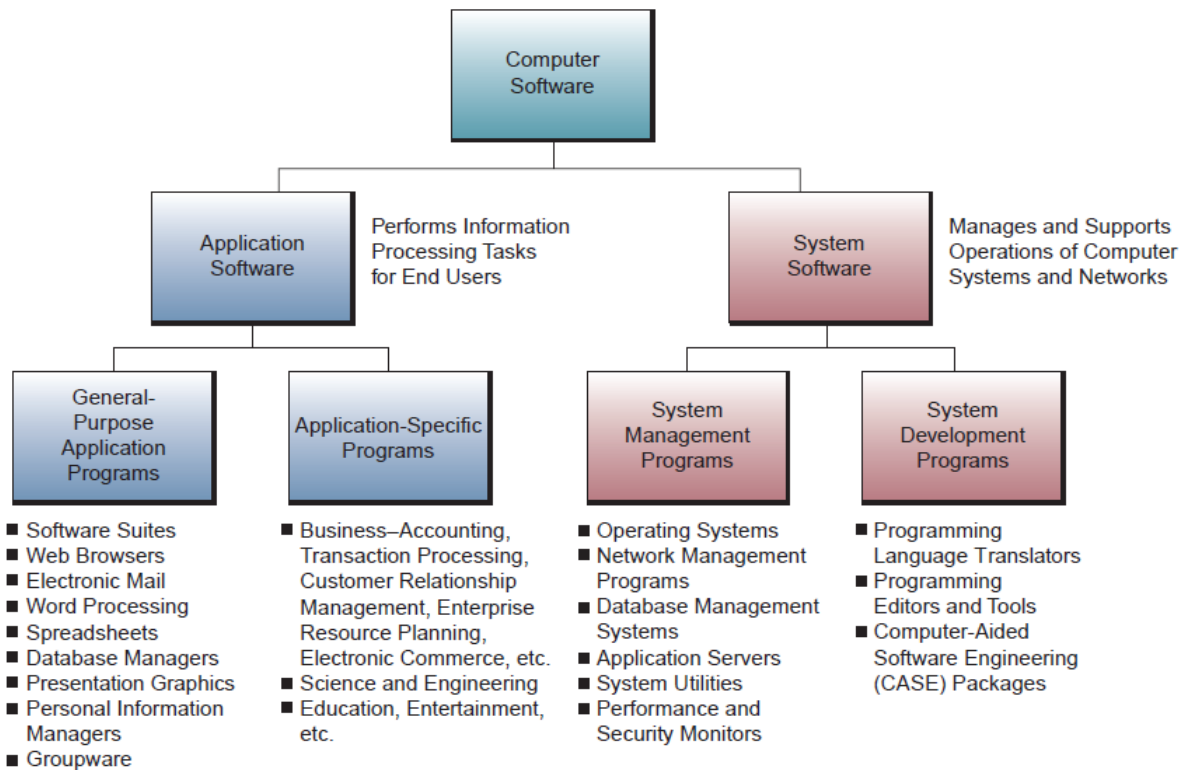


Figure 4: An Overview Of Computer Software

2.2. Information Systems

According To O’Brien, & Marakas, An Information System (IS) Can Be Any Organized Combination Of People, Hardware, Software, Communications Networks, Data Resources, And Policies And Procedures That Stores, Retrieves, Transforms, And Disseminates Information In An Organization. People Rely On Modern IS To Communicate With One Another Using A Variety Of Physical Devices (Hardware), Information Processing Instructions And Procedures (Software), Communications Channels (Networks), And Stored Data (Data Resources).

According To David M. Kroenke & Randall J. Boyle, A Model Of The Components Of An IS Is Computer Hardware, Software, Data, Procedures, And People. Below Five Components (See Figure 5) Are Present In Every IS, From The Simplest To The Most Complex.

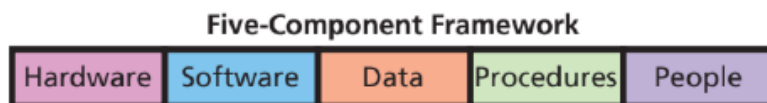


Figure 5: Five-Component Framework

The IS Knowledge That A Business Manager Or Professional Needs To Know Is Illustrated In Figure 2.5 And Covered In This Chapter And Text. This Knowledge Includes (1) Foundation Concepts: Fundamental Behavioral, Technical, Business, And Managerial Concepts Like System Components And Functions, Or Competitive Strategies; (2) Information Technologies: Concepts, Developments, Or Management Issues Regarding Hardware, Software, Data Management, Networks, And Other Technologies; (3) Business Applications: Major Uses Of It For Business Processes, Operations, Decision Making, And Strategic/Competitive Advantage; (4) Development Processes: How End Users And IS Specialists Develop And Implement Business/IT Solutions To Problems And Opportunities Arising In Business; And (5) Management

Challenges: How To Manage The Is Function And It Resources Effectively And Ethically To Achieve Top Performance And Business Value In Support Of The Business Strategies Of The Enterprise (Marakas, n.d.).

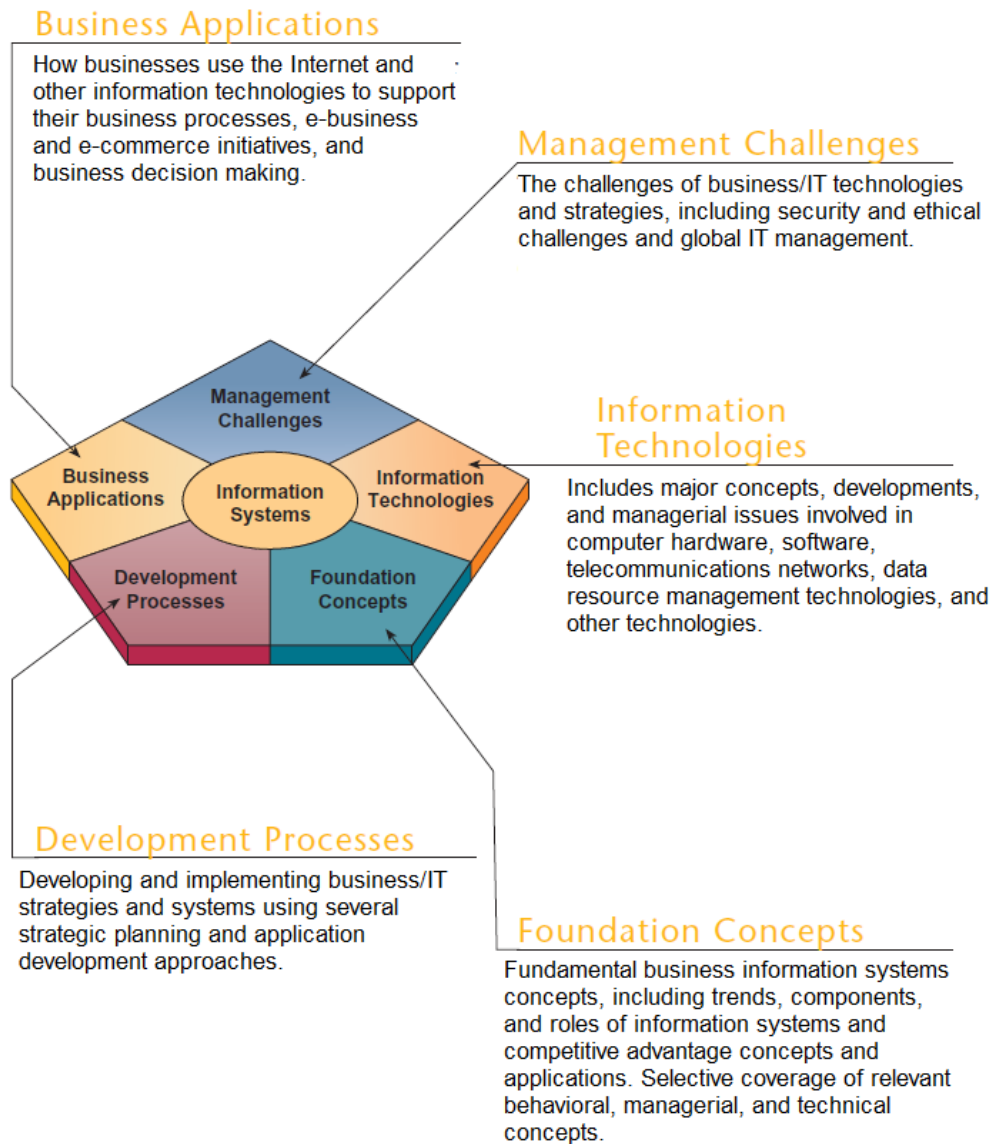


Figure 6: Basic Information Systems Framework

It Can Be Said That An Information System Is A System That Acts As A Mediator Between Companies, Businesses And The Environment As Well As Society. It Is A System At The Center Of The Business, Making The Process Of Gathering, Processing And Providing Information As Smooth As Possible. The Role Of The Information System Is Shown Through Two Sides, Inside And Outside The Enterprise.

Outside: Is Has The Role Of Collecting Data From The External Environment, And Bringing Information From Within The Business To The Outside. Types Of Information Collected And Provided To The Outside Include Information On Prices, Labor, Consumer Tastes, Commodity Demand, Inflation, Government Policies, Etc.

Inside: The Internal Is Of The Enterprise Acts As A Bridge Linking The Various Departments In The Business. It Collects And Provides Information To The Units Needed To Perform Different Purposes Set By The Business. For Example, Information On Production And Business Activities Of Enterprises During The Year; Information About The Enterprise's Managerial Qualifications; Information About The Company's Internal Policies; Information On Procurement, Import And Export Of Goods; Information On Sales, Revenue, Finance, Etc.

Information Systems Have Three Main Impacts On Businesses: (1) Supporting And Improving Competitiveness For Businesses: Is Help Businesses Operate More Efficiently, Cut Costs, Reduce Costs, Thereby Increasing Competitiveness For Products Sold. Furthermore, The Is Also Helps Shorten And Link The Gap Between Businesses And Customers And Suppliers; (2) Support For Business Decision Making: A Full Is Will Help The Managers Of The Business Have A Panorama Of The Production, Business, Financial Situation ... Of The Business, From There Can Make Appropriate, Correct And Effective Business Decisions; (3) Support In Business Operations: Is Allow Storing A Large Amount Of Necessary Information Such As Information About Customers, Suppliers, Product Information, Selling Prices, Labels, Expenses,... Help To Carry Out Operations And Business Activities Smoothly And Save Time.

2.3. Internal Environment

An Is Contains Information About An Organization And Its Surrounding Environment. Three Basic Activities - Input, Processing, And Output - Produce The Information Organizations Need. Feedback Is Output Returned To Appropriate People Or Activities In The Organization To Evaluate And Refine The Input. Environmental Actors, Such As Customers, Suppliers, Competitors, Stockholders, And Regulatory Agencies, Interact With The Organization And Its Information Systems (See Figure 7).

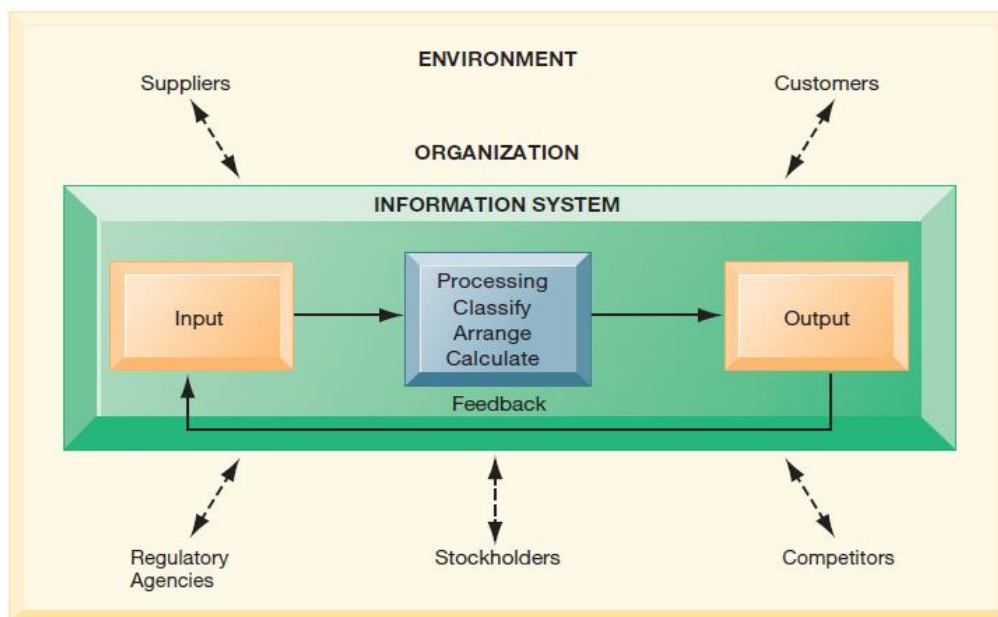


Figure 7: Functions Of An Information System

In Contemporary Systems, There Is A Growing Interdependence Between A Firm's Information Systems And Its Business Capabilities. Changes In Strategy, Rules, And Business Processes Increasingly Require Changes In Hardware, Software, Databases, And Telecommunications. Often, What The Organization Would Like To Do Depends On What Its Systems Will Permit It To Do (See Figure 8).

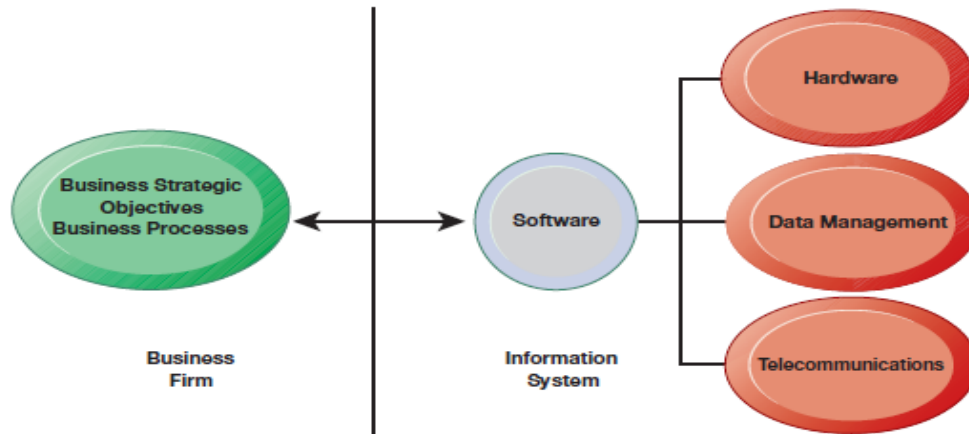


Figure 8: Interdependence Between Organizations And Is

2.4. External Environment

As Defined By Mis, Information Systems Exist To Help Organizations Achieve Their Strategies. An Organization's Goals And Objectives Are Determined By Its Competitive Strategy. Ultimately, Therefore, Competitive Strategy Determines The Structure, Features, And Functions Of Every Information System. Figure 9 Summarizes This Situation. In Short, External Factors That Will Affect Industry Structure, Organizations Examine The Structure Of Their Industry And Determine A Competitive Strategy. That Strategy Determines Value Chain, Thereby Deciding Business Processes. The Structure Of Business Processes Determines The Design Of Supporting Information System.

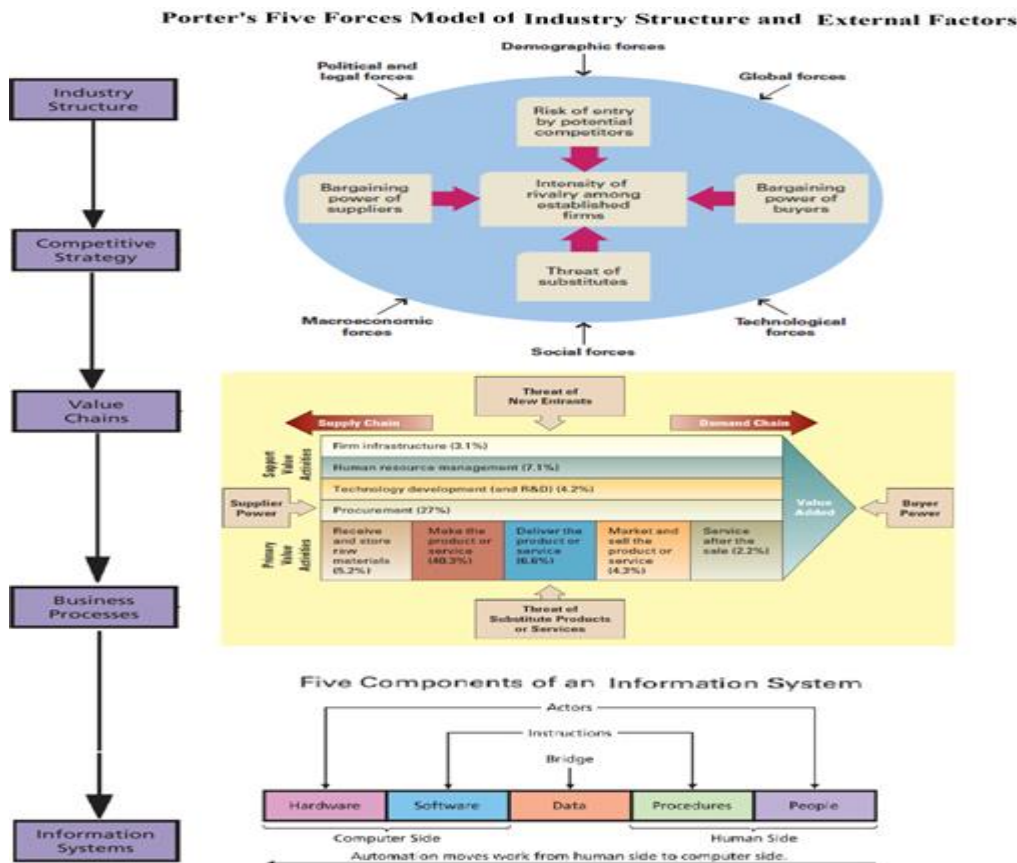


Figure 9: Organizational Strategy Determines Information Systems

2.5. Operational Efficiency

Operational Efficiency Is Primarily A Metric That Measures The Efficiency Of Profit Earned As A Function Of Operating Costs. The Greater The Operational Efficiency, The More Profitable A Firm Or Investment Is. This Is Because The Entity Is Able To Generate Greater Income Or Returns For The Same Or Lower Cost Than An Alternative. In Financial Markets, Operational Efficiency Occurs When Transaction Costs And Fees Are Reduced (Chen, 2019).



Figure 10: Formula For Efficiency

Organizations Spend Enormous Sums Of Money On It To Compete In Today’s Fast Paced Business Environment. Some Organizations Spend Up To 50 Percent Of Their Total Capital Expenditures On It. To Justify These Expenditures, An Organization Must Measure The Payoff Of These Investments, Their Impact On Operational Efficiency, And The Overall Business Value Gained. Efficiency And Effectiveness Metrics Are Two Primary Types Of It Metrics. Efficiency It Metrics Measure The Performance Of The It System Itself Such As Throughput, Speed, And Availability. Effectiveness It Metrics Measure The Impact It Has On Business Processes And Activities Including Customer Satisfaction, Conversion Rates, And Sell-Through Increases. Operational Efficiency Is Primarily A Metric That Measures The Efficiency Of Profit Earned As A Function Of Operating Costs, Speed And Ability To Meet The Requirements Of It Systems. This Is Because The Entity Is Able To Generate Greater Income Or Returns For The Same Or Lower Cost Than An Alternative. In Addition, The Target Of Is/It System Is Always Closely Linked With The Goals Of The Business. Thus, Enhancing Operational Efficiency Of Is/It System Is An Effective Tool Create Brand Value And Optimal Competitive Position In The Market.

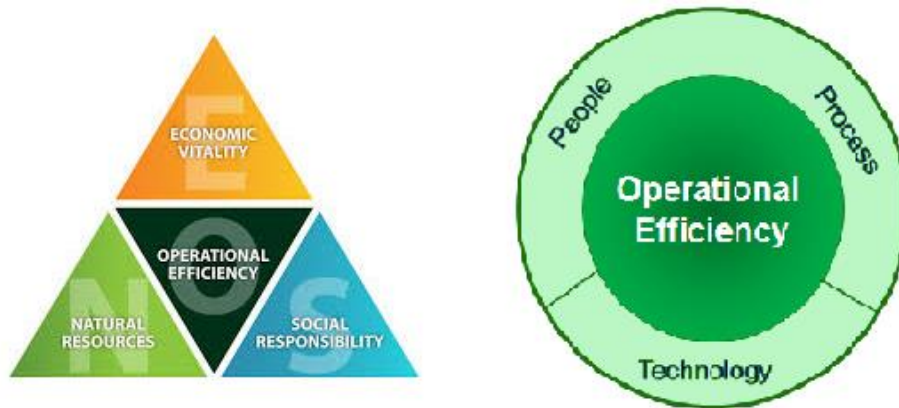


Figure 11: Operational Efficiency

The ‘Technical’ Way To Measure Operational Efficiency Is To Calculate The Ratio Of Output Gained To The Input Expended. Input: Operational Expenditure (Opex), Capital Expenditure (Capex), People (Measured Either As Headcount Including Headcount Of Partners, Or As Total Number Of Full-Time Equivalents); Output: Revenue, Customer Numbers/Distribution Between Segments, Quality, Growth, Customer Satisfaction (Wikipedia, 2021). It Can Enhance Operational Efficiency By Use Data To Increase Visibility; Focus On Business Needs, Not Technology; Build Connections With Stakeholders; Lean Into The Cloud; Automate; Consider A New Department Model; Integrating Workflows And Reducing Manual Processes; Increase Efficiency And Effectiveness Of Business Operations; Provide An Easy Access To Real-Time Data; Allow For

More Transparent Business Processes; Improve Internal And External Customer Service; Migrate From A Paper Processing Environment To An Analytical Environment.

2.6. Previous Studies On Is/It Systems

In Today's Ever Increasingly Competitive Markets, Business And Enterprises Rely More And More In Their Is To Achieve Their Purposes Of Effectiveness And Efficiency. New Technology Offers New Opportunities For Increased Business And Interaction. The Information System Is Implemented With The Sole Purpose Of Improving The Usefulness And Efficiency Of Business Activities And Interactions. The Is Ability And The Characteristics Of That Business, Its Employees, And The Development And Implementation Of Is Systematically Determine The Extent To Which That Goal Is Fulfilled. (Adegoke, 2014) Explain That Is Enhances Hardware, Software, And Internet Coordination To Collect, Filter, Process, Create, And Distribute Data Within A Confined Network To Achieve Business. Is Development Can Be Seen As An Interactive Process In Which A Number Of Collective Work Activities Are Facilitated By Emerging It Means Through Analysis, Design, Implementation, Introduction And Sustained Support, As Well As Manage Processes To Achieve Business Excellence. Enterprise Resource Planning (Erp) In Improving Operational Efficiency (Ignatio Madanhire, 2016)

Similarly, (Boyle, 2008) Defined Information Systems As An Interaction Formed By Users And It (Such As Process, Data, Models, Applications, Machines And Others) To Achieve Some Organizational Functions And Purposes. These Interactions Can Occur Within Or Across Organizational Boundaries. Information Systems Are Technologies That An Organization Uses And Also How The Organization Interacts With The Technology And How It Works With The Organization's Business Processes. Hence, Information System Is The Interconnection And Operation Of It And Human Managerial Skills To Achieve Business Productivity And Excellent. Submitted That The Automation Of A Process Activity Consists Of Moving Work From The Human Side To The Computer Side And Low Productivity Occurs When The Business Operation Functions And Excels Better In Manual Mode Compare To The Is Mode.

(Chieochan, et al., 2000) Note That The Use Of Information Technology Is A Form Of Technological Innovation. It Consists Of The Following Four Categories Of Relevant Factors: Ceo Characteristics (Ceo Innovation, Ceo Attitude Towards Adoption Of It, Ceo It Knowledge); Organizational Characteristics (Business Size, Competitiveness Of Environment, Information Intensity); Internal Environment (Innovation, Attitude, It Knowledge, Business Size, Structure, Culture); And External Environment (Political, Economic, Social, Technology, Customers, Suppliers, Competitors). It Is Complemented By (Surinta, 2018) Factors Influencing The Adoption Of Agricultural Management Information Systems In Thailand Include Internal Factors Affecting The Adoption Of Ict In Agricultural (It Knowledge, Attitude To The Use Of It, Hardware, Software, Database, Business Size, Organizational Culture, Lack Of Motivation To Use, Training And Education, Etc.) And External Factors Affecting The Adoption Of Ict In Agricultural (Government Support, Social-Culture, Policy, Economic, Competitive Environment).

There Have Been Many Researches In Domestic On Enhancing Operational Efficiency Of It Systems: Apply Information Technology In Managing Work At The Ministry Of Home Affairs (Le_Thanh_Tung, 2017); Research On Solutions To Improve The Efficiency Of Information Technology Application In Training National Athletes (Nguyen_Manh_Tuan, 2020); In Particular, Research On Building A Comprehensive Information System For The Academy Of Social Sciences, Vietnam (Nguyen_Dinh_Chinh, 2016) Identified Growing Criticism Of Poor Alignment Of Is And Business Needs. That Affects The Accuracy Of Information, Scatter In Management Operation And Handling Manual Jobs And It Is Difficult To Meet The Needs Of Expanding Training Scale In The Future. Through The Study And Application Of The Overall Architecture, It Is Possible To Propose A Solution To Build Professional And Synchronous Management Information Systems, Meeting The Operational And Development Needs Of Training Units.

Previous Studies Have Discovered The Factors That Affect The Enhancing Operational Efficiency Of It Systems. There Is No Universal Model For All Types Of Organizations. Therefore, We Need To Synthesize Previous Studies To Give A Suitable Model For The Actual Need Of Research. That Is Also The Basis For This Study To Test And Evaluate The Impact Scale To Improve The Performance Of It System In Saigon Union Company, Vietnam.

2.7. Proposed Research Model

From The Basis Of Theories And Related Studies, On The Basis Of Inheriting And Selecting The Factors That Affect The Same Research On Enhancing Operational Efficiency Of It Systems, The Author Uses Components

In The Studies, Empirical Research By Adegoke (2014), David M. Kroenke & Randall J. Boyle (2008), Chieochan, Et Al., (2000), Nguyen Dinh Chinh (2016). However, In The Actual Conditions In Vietnam In General, The Conditions Of Ho Chi Minh City In Particular, The Research Model Cannot Fully Reflect But Has To Adjust And Supplement Some Observed Variables Accordingly Actual Conditions, Helping To Research And Apply The Model In Accordance With The Research Conditions At Saigon Union Company. The Proposed Model Is Shown In Figure 12.

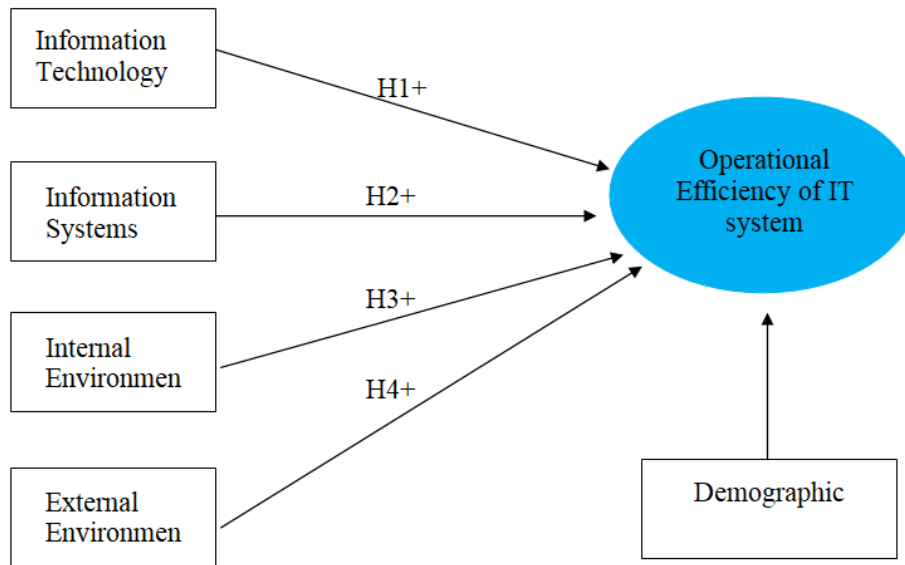


Figure 12: The Proposed Research Model

III. Data Collection

Research On Factors Affecting To Enhance Operational Efficiency Of It Systems For Saigon Union Is Done By Two Methods: Qualitative Research And Quantitative Research.

The Purpose Of Qualitative Research Is To Examine Whether The Scales Used In The Study Are Appropriate For The Environment At Saigon Union Company, And At The Same Time Evaluate The Use Of The Terminology In The Questionnaire, And Clarify The Meaning Of Each Question Before Formal Study. The Purpose Of This Study Is To Explore Ideas, At The Same Time Gather More Information, Supplement And Adjust The Questionnaire, And Build A Formal Questionnaire To Conduct Quantitative Surveys. Qualitative Research Also Indicates The Key Variables Of Dependent Variable (Enhancing Operational Efficiency Of It Systems) Such As (1) Reduce Operating Costs; (2) Save Time, Effort And Increase Working Efficiency; (3) It Is Possible To Work Remotely, Reducing The Influence Of Covid-19.

Preliminary Quantitative Study Was Performed Using The Method Of 17 Saigon Union Managers. The Purpose Is To Evaluate The Content And Form Of Statements In The Draft Scale To Complete The Official Scale Used In Official Research. In Which, The Important Task Of This Step Is To Assess Whether The Respondent Understands The Questionnaire Or Not (Formal Assessment Is The Step To Check The Wording And Grammatical Relevance Of The Guarantee Statements. Consistency, Clarity, Not Confusing Respondents) And Evaluate The Reliability Of Observed Variables With Likert 5 Scale To Remove Inappropriate Variables And Present A Formal Questionnaire. Official Quantitative Research Was Conducted Through A Survey Of 128 Employees Of The Saigon Union. When The Results Are Available, The Author Will Conduct Statistical Synthesis Based On The Information Obtained From The Survey. Research Has Used Spss 20 Software To Test The Scale With Cronbach's Alpha Index. After Analyzing Cronbach's Alpha, Exploratory Factor Analysis (Efa), Testing Hypotheses Using Regression Models With Spss 20.0 Software.

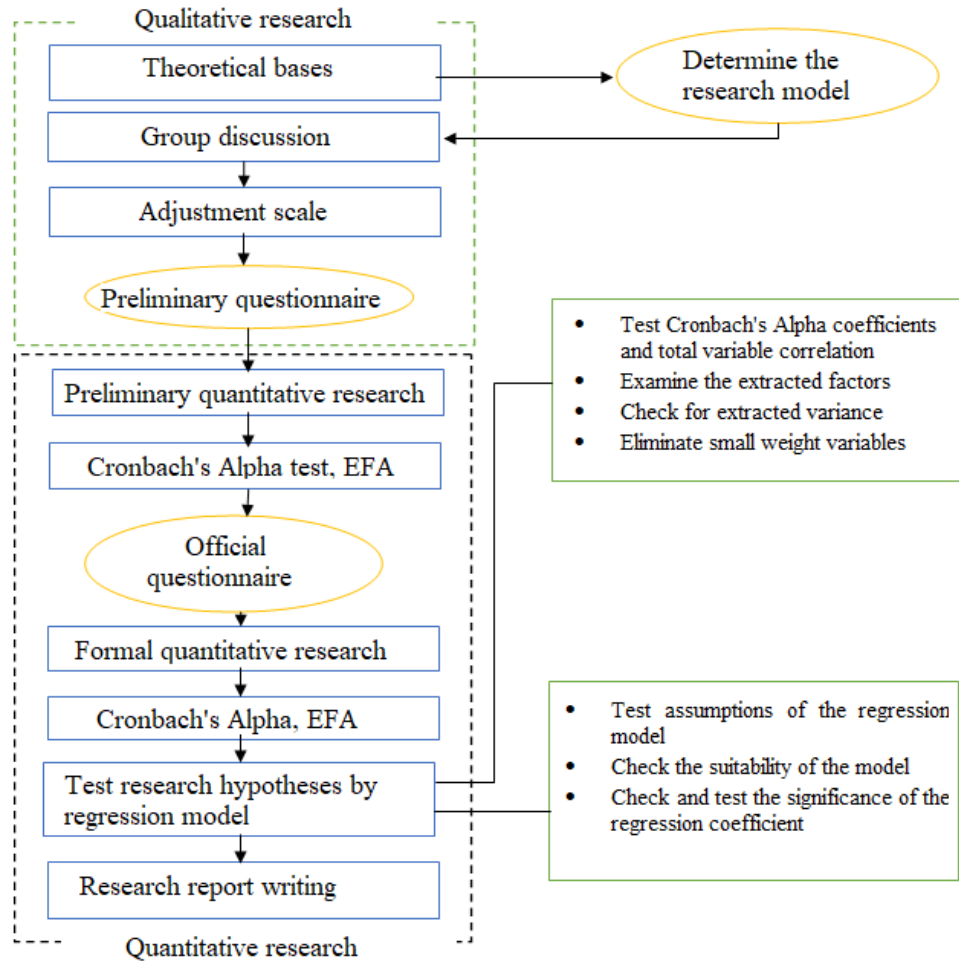


Figure 13: The Research Process

IV. Data Analysis And Result

After Analyzing Cronbach's Alpha's Reliability Coefficients, The Scales Are Further Evaluated By Exploratory Factor Analysis (Efa) Method. Cronbach's Alpha And Efa Results Show That There Are 21 Observed Variables Of 4 Measurement Components And 3 Observed Variables Of Measuring Components "Enhancing Operational Efficiency Of It Systems" Are Kept As Before Which Could Use For This Study. In Other Words, After Evaluating The Reliability Of Scales By Cronbach's Alpha And Exploratory Factor Analysis (Efa), There Is No Observable Variable Removed From The Original Model. Hence, The Final Research Model Still Retains Four Independent Factors And One Dependent Factor.

Table 1: Summary Results

	Factor	Number Of Items	Cronbach's Alpha Value	% Of Variance	Conclusion
Independent Factors	Information Technology (It)	5	0.822	58.661%	Qualified
	Information Systems (Is)	5	0.815		
	Internal Environment (Ie)	6	0.810		
	External Environment (Ee)	5	0.832		
Dependent Factor	Operational Efficiency (Oe)	3	0.750	66.662%	Qualified

Secondly, We Are Interested In Correlation Analysis, Regression Analysis Will Be Performed To Clarify The Relationship Between The Independent And Dependent Variables. All Qualifying Dependent Variables Are Displayed In The Regression Equation Or Have Any Dependent Variables Removed. The Results Showed That All Pearson Correlation Sig Values Between The Independent Variables And The Dependent Variable Were Less Than 0.05. Thus, The Independent Variables Are Linearly Correlated With The Dependent Variable.

Table 2: Correlation Analysis

		Oe	It	Ie	Is	Ee
Oe	Pearson Correlation	1	0.647**	0.538**	0.489**	0.509**
	Sig. (2-Tailed)		0.000	0.000	0.000	0.000
	N	128	128	128	128	128
It	Pearson Correlation	0.647**	1	0.178*	0.267**	0.243**
	Sig. (2-Tailed)	0.000		0.044	0.002	0.006
	N	128	128	128	128	128
Ie	Pearson Correlation	0.538**	0.178*	1	0.308**	0.490**
	Sig. (2-Tailed)	0.000	0.044		0.000	0.000
	N	128	128	128	128	128
Is	Pearson Correlation	0.489**	0.267**	0.308**	1	0.404**
	Sig. (2-Tailed)	0.000	0.002	0.000		0.000
	N	128	128	128	128	128
Ee	Pearson Correlation	0.509**	0.243**	0.490**	0.404**	1
	Sig. (2-Tailed)	0.000	0.006	0.000	0.000	
	N	128	128	128	128	128
**. Correlation Is Significant At The 0.01 Level (2-Tailed).						
*. Correlation Is Significant At The 0.05 Level (2-Tailed).						

In One Research Paper, The Step Of Running Spss Regression For Quantitative Research Is Extremely Important. It Helps To Determine Which Factors Contribute More/Less/Not To The Change Of The Dependent Variable, In Order To Offer The Most Necessary And Economical Solutions.

Table 3: Regression Model Summary

Model	R	R Square	Adjusted Square	Std. Error Of The Estimate	Durbin-Watson
1	0.817 ^a	0.667	0.656	0.36710	1.443
A. Predictors: (Constant), Ie, It, Is, Ee					
B. Dependent Variable: Oe					

The Adjusted R-Squared Is 0.656 = 65.6%. Thus, The Independent Variables Put Into Regression Affect 65.6% Of The Change Of The Dependent Variable. In Other Words, Adjusted R-Squared Is 65.6% Of Variance Of Operational Efficiency Of It Systems Is Explained By 4 Factors (Information Technology, Information Systems, Internal Environment, External Environment).

Table 4: Regression Model Summary

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics		Result To Hypothesis
		B	Std. Error	Beta			Tolerance	Vif	
1	(Constant)	-0.129	0.209		-0.618	0.538			
	Is	0.157	0.047	0.197	3.368	0.001	0.794	1.260	Accepted
	It	0.435	0.048	0.501	9.159	0.000	0.905	1.105	Accepted
	Ee	0.112	0.046	0.155	2.450	0.016	0.679	1.472	Accepted
	Ie	0.306	0.059	0.312	5.177	0.000	0.744	1.345	Accepted

A. Dependent Variable: Oe

The Regression Results Show That All Variables Have An Impact On The Dependent Variable Because The T-Test Sig Of Each Independent Variable Is Less Than 0.05. We Can Use This Result For Further Analysis.

The Vif Coefficients Of The Independent Variables Are All Less Than 10, So No Multicollinearity Occurs.

Compare The Impact Level Of These Four Variables On The Dependent Variable In Descending Order As Follows: It Has The Most Impact ($B1 = 0.501$), The Next Ie ($B3 = 0.312$), Followed By Is ($B2 = 0.197$), And The Lowest Impact Is The Variable Ee ($B4 = 0.155$). Thus, Hypotheses ($H1, H2, H3, \text{ And } H4$) Are Accepted At 95% Confidence Level.

Operational Efficiency $Oe = 0.501 X \text{ Information Technology Factor } It + 0.312 X \text{ Internal Environment Factor } Ie + 0.197 X \text{ Information Systems Factor } Is + 0.155 X \text{ External Environment Factor } Ee + E$

In Which, E Represents The Unknown Factors And Errors.

Lastly, One-Way Anova Is Developed For Other Demographic Variables Which Have More Than Two Aspects, Including Positions In Company, Age, Time Working, And Gender. The Results Indicated That There Is No Difference In Operational Efficiency Between Respondents With Different Working Positions, Employee Ages, Time Working At Company And Gender With Statistically Significant At 95%.

V. Recommendations And Conclusion

5.1. Recommendations

Information Technology Factors: The Current Challenges Of Is/It Systems Such As Poor Infrastructure (Lack Of Requirement On Is/It); Inadequate Skills (Lack Of Knowledge Of The People On The Is/It); Lack Of Training (Lack Of Staff To Implement The Is/It); Lack Of Stakeholders Participation And Awareness; Financial Resources, Policies And Regulation To Integrate Mis (Lack Of Budget For Software And Hardware); Lack Of Standardization (Uniformity Of Data Handling Procedures); Parallel Reporting (Lack Of Coordination); Absence Of Supportive Supervision; Poor Use Of Information Should Be Addressed In Order To Contribute To Improving The Performance Of It Systems.

Firstly, Improve The It Knowledge Of Staffs, Enhanced Training Job And Handling Skills. Studying New Technologies And Apply Them To The Saigon Union It Operations. Speeding Up The Key It Projects To Support The Best For Business. Developing And Implementing Security Standards, Is Ensures Continuous Operation And Safety Of It Systems. Make A Plan To Recruit The Enough Capacity Staff To Meet The Construction Testing Network's Requirement. Build Up The Recruit Mechanism For Right Person And Right Job. Minimize Percentage Of Turnover. Constructing Staff For Sufficient Quantity; Have Good Moral Qualities; Qualified Skilled Professionals; Good It Qualifications; Good Language, With A Professional Working Style, Exemplary, Unity, Dedication, Cooperation, Sharing, Responsibility, Sticking To The Development Of Saigon Union.

Secondly, Fundamental Investment In It (Computer Hardware, Software And Internet): The Initial Investment Of Enterprises In It Including Basic Equipment Of Hardware, Software And Internet. All Three Components Must Be Invested Homogeneously To Bring The Best Performance For The It Systems. The Level Of "Basic" Equipment May Be Heterogeneous, However, There Are Some Key Requirements In Terms Of Technology Infrastructure (Hardware & Software) Sufficiently Equipped To Deploy Some Applications Business Routine Such As: Equipping Computers, Setting Up Lan, Wan, Establishing Internet Connection, Communication Environment Between Internal Offices Or Between Partners; About People Are Trained To Use The Above Infrastructure In Some Business Operations Or Management Of The Enterprise, Investing In This Period Is To Build A "Foundation" For The Next It Applications. For Example, A Transaction Processing System (Tps) Is A Computer System That Executes And Records Daily Routine Transactions Necessary To Conduct Business, Such As Sales Order Entry, Cash Deposits, Hotel Reservations, Payroll, Employee Record Keeping, Credit Decisions, Flow Of Materials In Factory And Shipping. A Tps For Payroll Processing Captures Employee Payment Transaction Data (Such As A Time Card). System Outputs Include Online And Hard-Copy Reports For Management And Employee Paychecks.

Lastly, In Order To Enhancing Operational Efficiency Of It Systems, Is/It Digitalization Is The Result Of A Number Of Contributing Trends In Contemporary Business Life. The Development In It And Software Has Led To A Significant Computerization Of Business Life. Today, It Is Hard To Imagine Most Business Processes Being Carried Out Without Any Technological Support. Digitalization Of Products And Services Is A Fast-Moving, Global Megatrend That Is Fundamentally Changing Existing Value Chains Across Industries And Public Sectors. The Manifestations Of This Ongoing Digital Transformation Are Various, And There Are Many Emerging Technologies Have Been Used. E.G. Mobile Apps, Big Data, Machine-To-Machine, Internet Of Things (Iot), Artificial Intelligence (Ai), Industrial Internet, And Industry 4.0. However, Modern Wireless Internet-Based Technologies With Real-Time Data Analysis Are The Common Tools Of These Digital

Applications To Provide Organizations With Great Business Improvements - For Example Increasing Revenue Through New Online Sales Opportunities, Enhancing Operational Efficiency Via Increased Level Of Automation, And Reducing Fixed Assets Via New Cloud-Based Business Models.

Internal Environment Factors: According To The Result Of The Survey, It Can Be Easily Understood That The Internal Environment Factor Affects The Enhancing Operational Efficiency Of It Systems. Research Results Show That "Internal Environment" Is The Second Most Influential Factor On The Operational Efficiency In The Group Of 4 Impact Factors Within The Research Scope Of The Topic.

Firstly, In The Implementation Of Is/It System, The Ceo Plays A Very Important Role, Deciding Success Or Failure. Accordingly, The Leader Must Be Communicative, Have Vision, A Digital Level, Have A Strategy To Turn Vision Into Reality, Innovate, Take Risks, Referee And Adapt. At The Same Time, As Well As Need The Participation Of All Members In The Unit. To Successfully Enhance Operational Efficiency, It Is Necessary To Bring Together A Team Of Transforming Traditional Businesses To Digitalization Business. This Team Includes Member Internal And Outsourced Consultants. These Consultants Typically Include Team Leader, Information Technology Specialists, Business Professionals, Financial And Accountants, And In Some Cases Requiring Lawyers, Insurance Experts. This Group Is Not Only Creative, Resourceful And Dynamic, But Also Needs To Focus On The Basic Motivations To Drive The Business Expansion Strategy Of Is Development, Product Diversification, And Expanding Customer Market. In Order To Successfully Expand The Business And Increase The Value Of The Enterprise, All Team Members Need To Link Together In A Unified Way Of Thinking And Acting To Achieve Common Goals. In Addition, Encourage The Company's Employees To Apply It To Their Work. Coordinate With Departments In The Headquarters In Order To Conduct Management Plan, The Transfer Of Technological, Cost Allocation, Etc. Capacity Building Of Data Warehouses Such As Implementation Of Management Reports, Support Decision-Making. Researching And Implementing Technology To Manage Resource Is One Of The Most Effective, Most Flexible. These Motivations For Using It Help Enhance The Operational Efficiency Of It Systems.

One Thing To Keep In Mind When Enhancing Operational Efficiency Of It Systems Is To Protect Culture And Maintain The Connection Between Employees And The Company's Shared Vision, Mission, And Core Values. Usually, Founders, Co-Founders Or Loyal Employees Will Be The One Responsible For Ensure A Company Culture Is Maintained In The Multi-Branch Network. If The Business Does Not Take This Factor Seriously, The Company's Business Culture Will Be Shaken, Especially In The Service Business. Communication Culture Between Branches, Departments And Employees Through It Application Will Help Improve The Performance Of It Systems. Widely Deploying It Applications In The Saigon Union's Management, Building Document Warehouse, Electronic Libraries, Open Resource, Etc. Contribute To Raising The Quality Of Management, And Efficient Product Deployment. Encourage Staff To Participate In Training Courses To Improve Identification Of New Technologies, Information Security Factors, Etc. To Serve Customers And Professional Work. Training To Improve Knowledge Of It Will Help To Use It Systems More Effectively.

Finally, The Technological Inventions Are The Foundation Of The It Based Is That Imbue Contemporary, And Most Certainly Also Future, Business Life. In Addition, The Global Trend Of Increased Digitalization Activity With A E-Government Trend Forces Companies To Rethink Their Is/It Strategies And Adapt To A Rapidly Evolving Context For Information Infrastructure. As Technological Developments In Enterprise Systems Affected The Integration Approaches, It Is More Than Likely That Future Development Will Have Significant Impact On How Enterprises Are Fulfilling Their Needs Of Data Warehouse And Digitized Information Flows.

Information Systems Factors: Is/It Systems Can Enhance Operational Efficiency By Use Data To Increase Visibility; Focus On Business Needs, Not Technology; Build Connections With Stakeholders; Lean Into The Cloud; Automate; Consider A New Department Model; Integrating Workflows And Reducing Manual Processes; Increase Efficiency And Effectiveness Of Business Operations; Provide An Easy Access To Real-Time Data; Allow For More Transparent Business Processes; Improve Internal And External Customer Service; Migrate From A Paper Processing Environment To An Analytical Environment. In Developed Countries They Have Applied A Lot Of Management Information System (Mis) For Businesses. However, The Application Situation In Vietnam Is Still Very Limited And Not Even Used. Research Results Show That "Information Systems" Is The Factor With The Third Largest Influence On The Operational Efficiency In The Group Of 4 Impact Factors Within The Research Scope Of The Topic. But This Is A Factor That Has Potential To Enhance The Operational Efficiency Of It Systems.

There Is No Common Roadmap For Long-Term Strategy, But Each Business Must Develop Its Own Roadmap; Assess Convertible Cost And Non-Convertible Cost; Easy But Effective Work Is Done First; Prioritize Investment In Modules To Help Accumulate High-Value Data; Prioritize Modules For Creating New Services, Retraining, And Transferring Redundant Staff From Automated Processes. To Enhance The Operational Efficiency Of It Systems, Saigon Union Has Developed Its Own Digitalization Strategy For Comprehensive Development Of The It System. Improving Production Lines, Processes, And Enhanced Machinery Capacity. Stable Revenue Stream And Minimizes Business Risk By Diversifying Products And Services. To Diversify The Market And Increase Market Share, Dominate The Distribution Channel, And Increase Market Competitiveness. Develop New Policies For Products, Target Customers, And Focus On Revenue Growth. Control And Reduce Bad Debt Ratio While Enhancing The Risk Management. Develop Marketing Of Saigon Union Products And Services. Ensure Human Resources Quality For The Construction Testing.

The Goal Of Invest In It To Enhance Operational Efficiency, Support Functional Departments In The Enterprise, Specifically For The Operation Of Functional Departments Or Groups. This Is A Natural Development Step Of Most Businesses, Because The Amount Of Information Needed To Process Increases, And The Necessary Skills In It Application Have Been Acquired In The Previous Stages. Investments To Automate Operational And Business Processes To Improve The Efficiency Of Business Operations Such As Deploying Applications To Meet Each Operational Area And Ready To Expand According To Business Requirements; Financial-Accounting Program, Human Resource-Salary Management, Sales Management; Discrete Operational And Statistical Applications, It Directly Impact The Application Exploitation Department. For Example, Management Information Systems (Mis) Provide Information In The Form Of Reports And Displays To Managers And Many Business Professionals. This Information Is Used To Monitor And Control The Business And Predict Future Performance. Mis Summarize And Report On The Company's Basic Operations Using Data Supplied By Tps.

External Environment Factors: Research Results Show That "External Environment" Is The Factor With The Weakest Impact Level On The Operational Efficiency In The Group Of 4 Impact Factors Within The Research Scope Of The Topic. There Is A Note That External Environment Factors Do Not Affect Often, But Because They Greatly Affect The Operational Efficiency Of It Systems.

Government Supports On It Infrastructure, Architecture And Development To Help Enhance Operational Efficiency Of It Systems. For Example, "National Digital Transformation Program To 2025, With An Orientation To 2030". Economic Regulate The Exchange Of Materials, Money, Energy, And Information. Decisions And Expanding Operations Are Obviously Also Influenced By The Characteristics Of Each Enterprise. It Includes Variables Such As Size And Development Stage, Industries And Fields, Economic And Financial Situation, Exchange Rates, Unemployment Rates And Corporate Philosophy. Sociocultural Regulate The Values, Mores, And Customs Affect An Industry. Like Other Macro-Environmental Forces Discussed Here, Social Change Creates Opportunities And Threats. It Includes Variables Such As Population, Age, Gender, Role And Status. The Recent Impacts Of The Covid-19 Epidemic Have Led Businesses To Gradually Shift To Digital Culture That Contributing To The Creation Of Business Culture Of The Digitalization Business, The Foundation Is Working Standards, Standards Measuring New Work, And A System Of Regulations And Tools To Ensure The Full Implementation Of Those Standards Throughout The Enterprise.

Business Management Will Be More Accurate And Efficient If Applying Information Technology System Such As: Mis, Crm, Erp, Scm, Bi, Etc. Access New Technology, Get The Right To Develop Products Or Services, Efficiently Use Human Resources, Key Personnel, Exploiting These Assets To Serve The Business Expansion. Clearly Defined Problems Such As Industry Leader; Enterprise Has A Strong Brand Name And A Target Market Share; Services And Products; Science And Technology; Geographic Location; Intellectual Property; Confidential Technology; Equipment And Machines; Human Resources; Testing Methods. Besides, The Plan Should Indicate The Importance Of Identifying Risks To Competitors In Business Expansion And The Roles/Responsibilities Of Each Network Member.

5.2. Conclusion

This Thesis Aims At Providing Readers The Study Of The Enhancing Operational Efficiency Of It Systems For Saigon Union. There Is A Very Important Aspect Of Enhancing Operational Efficiency That We Believe Has Not Been Given Enough Attention: Based On This Research The Results Of Analysis Enhancing Operational Efficiency Of It Systems In Shaping A New Working Environment Are Analyzed Focusing On Workforce Impact, Looking At The Modification Of Both Performed Tasks And Required Competences As Well As To More Generic Social Consequences (Job Satisfaction, Work-Life Balance, New Forms Of Employment). To

Support The Application Of The Proposed Roadmap To Assess The State Of A Company Journey Towards Industry 4.0 Considering The Following Dimensions: Strategy, Processes, Technologies, Products & Services And People.

Regarding The Factors Affecting To Improve Operational Efficiency, Research Has Shown That There Are 4 Components Affecting Performance From Strongest To Weakest In The Following Order: Information Technology (It, B1 = 0.501), Internal Environment (Ie, B3 = 0.312), Information Systems (Is, B2 = 0.197), External Environment (Ee, B4 = 0.155). Thus, Hypotheses H1, H2, H3, And H4 Are Accepted At 95% Confidence Level. According To The Linear Regression Equation, In Case That The Company Has Limited Of Resources To Improve The Elements In Each Factors, They Can Prioritize To Invest On The Strongest Elements Then The Next Following As Order.

This Study Focuses On Enhancing Operational Efficiency Of It Systems For Saigon Union. That Should Help Construction Testing Laboratories In Taking A More Systematic Approach Towards Is/It Digitalization. Although The Research Has Completed The Research Objectives, There Are Still Some Limitations As Follows:

Firstly, The Study Was Only Conducted With The Respondents Who Are Employees At Saigon Union, So The Results Of The Study Are Only Local In A Small Scale And It Is Likely That The Results Will Be Different In Other Companies, Sectors, Industries, And Regions. Further Research Should Be At The Industry Level For More Representative Results.

This Study Only Explains 65.6% Of The Variation Of Performance Enhancement By The Variation Of 4 Independent Variables (Information Technology, Information Systems, Internal Environment, External Environment). Thus, There Are A Number Of Other Factors Affecting To Enhance The Operational Efficiency Of The It System That The Research Has Not Found. The Next Topic Needs To Be Researched, Supplemented With Other Factors For The Study To Be More Complete.

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