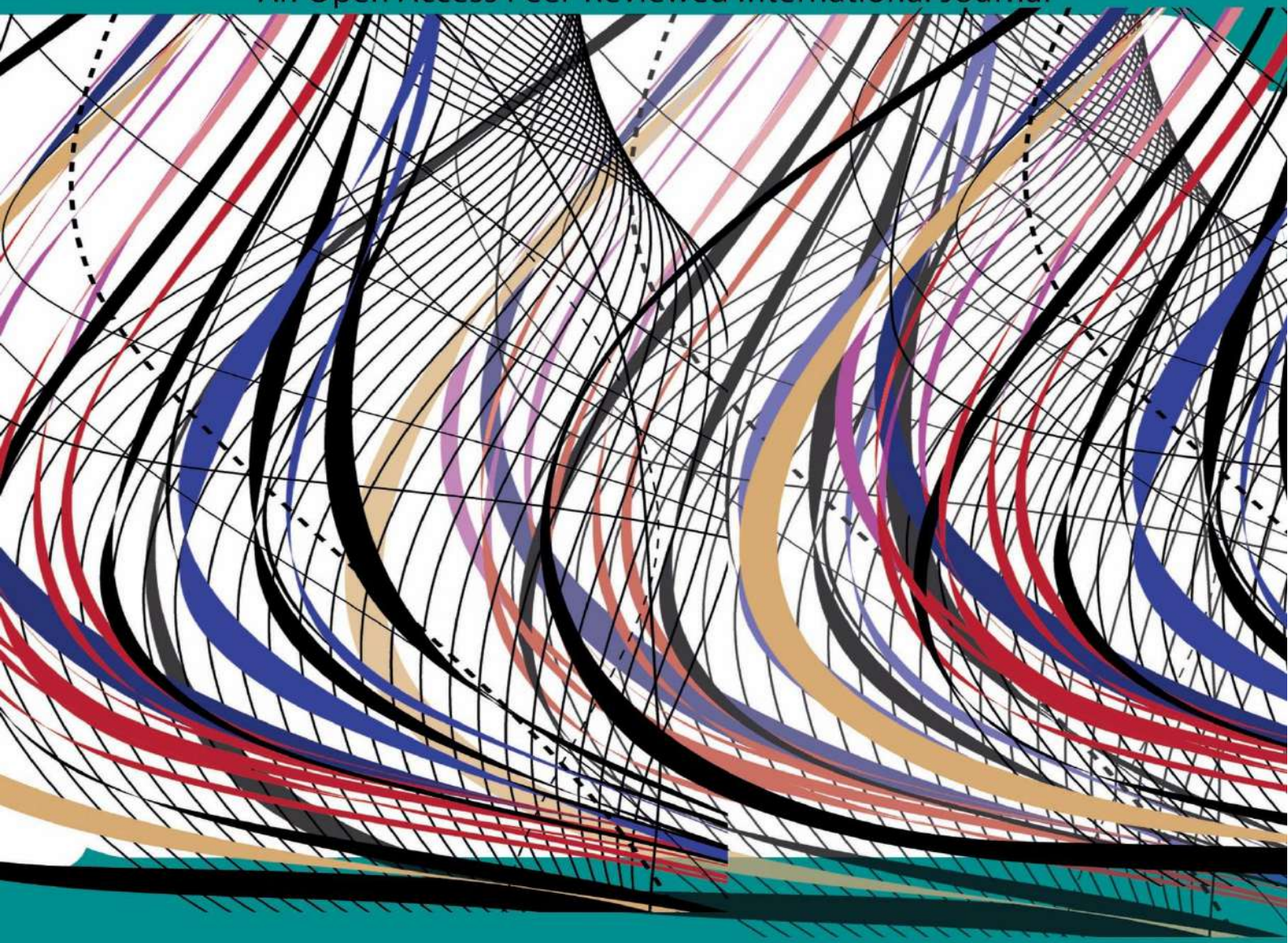
ISSN : 2454-1311

International Journal of Advanced Engineering, Management and Science

Journal CrossRef DOI: 10.22161/ijaems

(IJAEMS)

An Open Access Peer-Reviewed International Journal



Vol-8, Issue-5 | May 2022

Issue DOI: 10.22161/ijaems.85

INFOGAIN PUBLICATION

https://www.ijaems.com/ | editor@ijaems.com

International Journal of Advanced Engineering, Management and Science

(ISSN: 2454-1311)

DOI: 10.22161/ijaems

Vol-8, Issue-5

May, 2022

Publisher

Infogain Publication

Email: ijaems.editor@gmail.com ; editor@ijaems.com

Web: www.ijaems.com

Editorial Board/ Reviewer Board

Vol-8, Issue-5, May, 2022

(DOI: 10.22161/ijaems.85)

INFOGAIN PUBLICATION

International Journal of Advanced Engineering, Management and Science (IJAEMS)
Peer-Reviewed Journal
ISSN: 2454-1311 | Vol-8, Issue-5; May, 2022
Journal Home Page: https://ijaems.com/
Article DOI: https://dx.doi.org/10.22161/ijaems.85.1

Study on Predictive Maintenance for Controller Failure

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Received: 09 Apr 2022; Received in revised form: 02 May 2022; Accepted: 09 May 2022; Available online: 14 May 2022

Abstract**—***It is more important to be able to predict a failure before it occurs than to fix it after a failure. Attempts to predictive maintenance beyond reactive maintenance and preventive maintenance are increasing. This paper contains basic research to design a system that can predict controller failure before it occurs. The database related to the controller should be designed considering not only the data of the controller itself, but also the information on the operating environment, and the processing contents in the failure situation. In the latter part of the paper, data classification and analysis algorithms that can be used for failure prediction are summarized.*

Keywords**—*Predictive maintenance, Failure Prediction, Maintenance, AI.***

I. INTRODUCTION

The controller inevitably suffers damage due to external impact, wear, crack, etc. or degradation during operation, and such management incurs a large operating cost. It is very difficult to detect in advance a fatal accident that exceeds the limit level or a case of discontinuation of use with existing preventive activities. Currently, damage costs are incurred due to system downtime by relying on corrective maintenance to repair when a failure occurs. And since the current preventive activity actually depends on regular maintenance, maintenance is performed unconditionally regardless of the actual defect, and high costs are incurred due to frequent system downtime and replacement of parts due to appearance.

This paper is a basic research step to build a system that can predict a controller failure situation before it occurs. Then, we learn about predictive maintenance, and look at data organization and AI algorithms to design this system. Based on these contents, we plan to materialize a model that can be commonly applied to various controllers so that the controller can predict the current situation and future failure events by itself.

II. PREDICTIVE MAINTENANCE

Most of domestic maintenance is reactive maintenance, followed by preventive maintenance, and predictive maintenance using statistical techniques and AI is increasing recently.

Predictive maintenance is a method of preventing asset failure by analyzing production data to identify patterns and predict issues before they happen [1]. The key to this is a combination of big data analytics and artificial intelligence in order to create insights and detect patterns and anomalies. It includes continuous real-time monitoring of assets in combination with external data (e.g. environmental data, usage, etc.) with alerts based on predictive techniques such as regression analysis. The basic components of predictive maintenance in the context of industry 4.0 are: Sensors, Cyber-Physical Systems, Internet of Things, Big Data, Cloud computing, Networks and Artificial Intelligence, Mobile networks, WIFI[2].

Predictive maintenance is a data science technology that creates a predictive model by collecting a lot of data related to managed equipment. It does not predict equipment failure with just one or two signs, but quantifies and models numerous symptoms and historical data of actual failure. Of course, the more data, the more accurate it is also increases.

Table. 1: Comparison of Maintenance

	Reactive Maintenance	Preventive Maintenance	Predictive Maintenance
Advantage	• low cost • low human power	• Flexible adjustment of maintenance timing • Increase the lifecycle of components • Cost reduction compared to reactive maintenance	• Improving the operating life/availability of components • Dramatically reduce equipment or process downtime • Reduced parts and labor costs • Expect a lot of cost savings compared to reactive maintenance
Disadvantage	• Unplanned downtime of equipment or equipment • Increased labor costs • Equipment repair or replacement costs • Huge loss of revenue due to equipment failure • Occurrence of inefficient use of human resources	• Unplanned downtime of equipment • Unnecessary maintenance • Labor-intensive work	• Increased investment in diagnostic equipment • Increased investment in employee training

Table. 1: Correlation of Industrial Revolution and Maintenance [3]

Industry revolution	Industry 1.0	Industry 2.0	Industry 3.0	Industry 4.0
Characteristics of the industrial revolution	Mechanization, steam power, weaving loom	Mass production, assembly lines, electrical energy	Automation, computers, electronics	Cyber Physical Systems, IoT, networks, cloud, BDA
Type of maintenance	Reactive maintenance	Planned maintenance	Productive maintenance	Predictive maintenance
Inspection	Visual inspection	Instrumental inspection	Sensor monitoring	Predictive analysis
OEE	<50%	50-75%	75-90%	>90%
Maintenance team reinforcement	Trained craftsmen	Inspectors	Reliability engineers	Data scientists

Advanced predictive maintenance can make equipment maintenance extremely efficient. Regardless of the condition of equipment, it is possible to break away from the existing method of maintenance as planned, to repair equipment with a high possibility of actual failure first, and to prevent excessive maintenance such as replacement of unnecessary parts. In particular, predictive maintenance includes not only cutting-edge digital technologies such as AI and machine learning, but also industry-specific experts such as equipment, process, and chemistry to design, so it is possible to make more sophisticated predictions by incorporating the practical needs of industrial sites.

III. STEPS FOR FAILURE PREDICTION

1. Data Preprocessing

Data preprocessing consists of following steps.

① Reading data: read raw datasets.

② Checking the data: check for missing values, categorical data, and convert data if it is needed.

③ Standardizing the data: standardize data if it is needed.

④ Splitting the data: split data into train and test set.

2. Making data poll

Before training, making data poll databases is important.

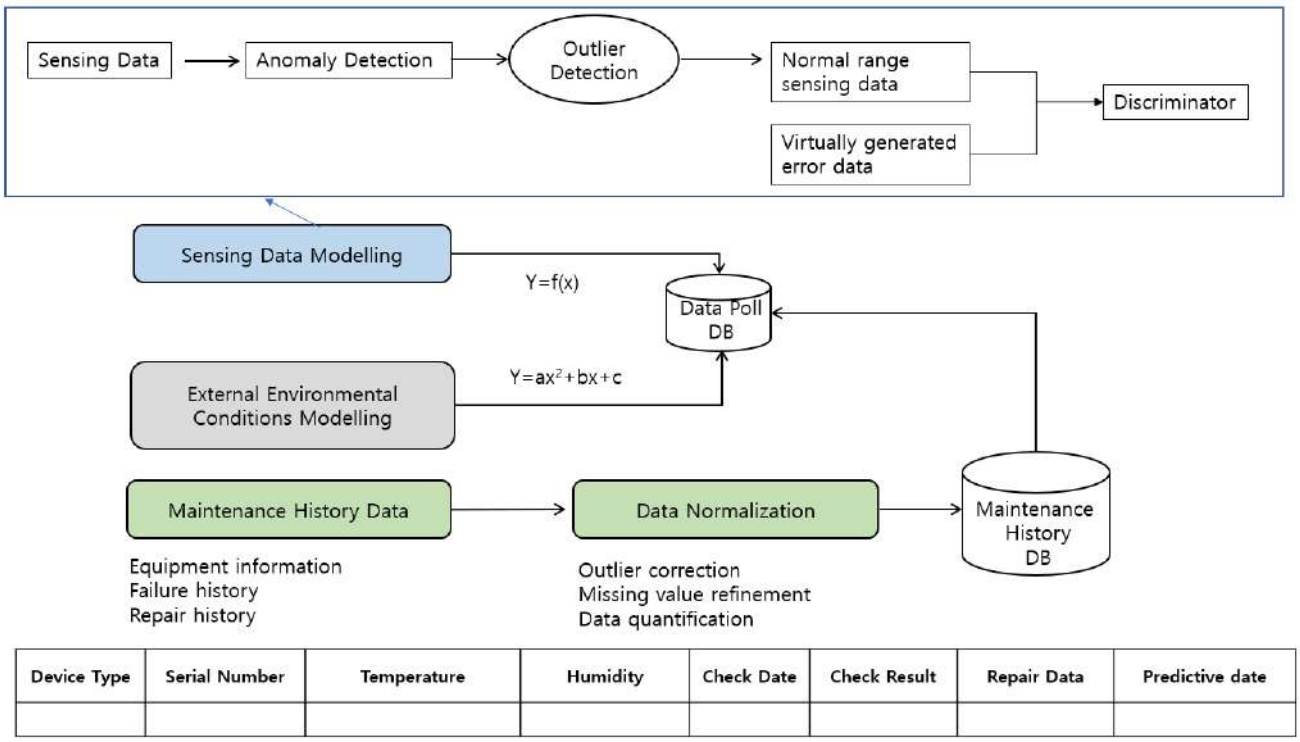

Fig. 1: Data Poll DB

3. Modelling for predictive maintenance

As the result of study, models for the predictive maintenance are as follows.

3.1 Random Forest

A random forest (RF) classifier is an ensemble classifier that produces multiple decision trees, using a randomly selected subset of training samples and variables. This classifier has become popular within the remote sensing community due to the accuracy of its classifications [4].

The computing time required to establish the RF classification model is:

$$T\sqrt{MNlog(N)} \quad (1)$$

where T is the number of trees, M is the number of variables used in each split, and N is the number of training samples [5].

3.2 Logistic Regression

The logistic regression model predicts logit values for each case as linear combinations of the independent variable values. A predicted logit for case i is obtained from the solved logistic regression equation by substituting the case's values of the independent variables into the sample estimate of the logistics regression equation[6],

$$\text{logit}_i = b_0 + b_1x_{i1} + b_2x_{i2} + \ldots + b_mx_{ik} \quad (2)$$

The predicted probability for case i is then given by

$$p_i = \exp(\text{logit}_i) / [1 + \exp(\text{logit}_i)] \quad (3)$$

3.3 Gradient Boosting

The Gradient Boosting algorithm is an algorithm that boosts using gradients. Boosting is the process of creating a strong classifier by combining weak classifiers. This process is performed sequentially by adding them one by one. If we continue this way, the residuals will continue to shrink, and we will be able to build predictive models that describe the training set well. However, this method can significantly reduce bias, but has the disadvantage of overfitting.

3.4 XGBoost

XGBoost(Extreme Gradient Boosting)is a scalable machine learning system for tree boosting, which is available as an open source package [7]. The algorithm implemented using the boosting technique is representative of Gradient Boost, and the library that implements this algorithm to support parallel learning is XGBoost.

It supports both regression and classification problems, and it is a popular algorithm because of its good performance and resource efficiency.Here, boosting is one of the ensemble techniques that uses a combination of several low-performance models.A strong prediction model is created by weighting the training errors of low-

performance prediction models and sequentially reflecting them on the next training model.

Advantages of XGBoost are as follows.

- Faster execution time compared to the existing boosting model (parallel processing)
- Support for over-conformance regulation (Regularization)
- High predictive performance in classification and regression tasks
- Early Stopping feature provided.
- Customizing is easy by providing various options.
- Handles missing values internally.

3.5 K Nearest Neighbors

kNN classifier is to classify unlabeled observations by assigning them to the class of the most similar labeled examples. Characteristics of observations are collected for both training and test dataset[8].

The appropriate choice of k has significant impact on the diagnostic performance of kNN algorithm. A large k reduces the impact of variance caused by random error, but runs the risk of ignoring small but important pattern. The key to choose an appropriate k value is to strike a balance between overfitting and underfitting [9].

3.6 Extra Trees

Extra tree (ET) employs the same principle as random forest and uses a random subset of features to train each base estimator[10]. However, it randomly selects the best feature along with the corresponding value for splitting the node[10].

RF uses bootstrap replicas, that is to say, it subsamples the input data with replacement, whereas ET use the whole original sample. Another difference is the selection of cut points in order to split nodes. RFchooses the optimum split while ET chooses it randomly.

3.7 Naïve Bayes

Naive Bayes is the simplest form of Bayesian network, in which all attributes are independent given the value of the class variable. This is called conditional independence[11].

Advantages [12]

- It requires short computational time for training.
- It improves the classification performance by removing the irrelevant features.
- It has good performance.

Disadvantages [12]

- The Naive Bayes classifier requires a very large number of records to obtain good results.
- Less accurate as compared to other classifiers on some datasets.

IV. CONCLUSION

This paper includes the characteristics of predictive maintenance, and database model made from sensing data, failure history, environment data. And We looked at algorithms for predicting controller failure. Using this basic study, by designing a situation-aware algorithm of the controller, by designing a situation-aware algorithm of the controller, it would be possible to adjust the transmission interval and transmission information according to the status of the controller rather than regular information transmission. In addition, it is expected to further minimize power consumption and improve reliability by judging the change in the controller status information and maximizing the recognition time for the failure situation.

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INFOGAIN PUBLICATION

International Journal of Advanced Engineering, Management and Science (IJAEMS)
Peer-Reviewed Journal
ISSN: 2454-1311 | Vol-8, Issue-5; May, 2022
Journal Home Page: https://ijaems.com/
Article DOI: https://dx.doi.org/10.22161/ijaems.85.2

Information Security Technology for IPv6-based IoT (Internet-of-Things)

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Received: 11 Apr 2022; Received in revised form: 03 May 2022; Accepted: 07 May 2022; Available online: 14 May 2022

Abstract**—***Various security threats may occur in the Internet-of-Things (IoT) environment. In this paper, we look at the threat factors for each layer that can occur in IoT, and especially recent studies related to authentication in the 6LoWPAN environment using IPv6 at the network layer. Based on this, in the future, we plan to configure the authentication protocol in the form of using a session key so that the other party can be verified before communication begins, and the session key is used so that they can trust each other and protect information during communication.*

Keywords**—*IoT security, IPv6 security, IPv6, 6LoWPAN, Authentication.***

I. INTRODUCTION

Although IoT devices and services have provided convenience to humans through smart control, recent incidents such as hacking and DDoS attacks are occurring because their security is weak. Personal information can be hacked through security loopholes, and furthermore, hacked IoT devices can be used for DDoS attacks or crimes.

IoT devices are being designed and manufactured to maintain minimum performance according to the lightweight and low-cost characteristics that try to keep the size and cost to the minimum possible. Therefore, it is necessary to internalize security from the initial design stage because it is often impossible or expensive to update security patches after being manufactured, distributed, or installed.

IoT device security requirements are common to all IoT devices. However, since IoT devices have different resources and processing capabilities, TTAclassifies them into several classes, and defines the security requirements according to this classification as shown in Table 1 [1].

- Class 0 devices: Devices such as ultra-small/ultralight/ultra-power-saving sensors with very high restrictions. Due to limitations in memory and processing power, direct Internet communication cannot be performed in a secure manner.

- Class 1 device has limitations in resources and processing capabilities, so it cannot easily communicate with other Internet devices to which protocol stacks such as HTTP or TLS, which are existing communication protocols, are fully applied. (Example: Medical health devices such as blood glucose meters based on 8/16 bit processors, smart home devices such as thermostats)

- Class 2 device: Basically, it is a device that can support the existing communication protocol stack or has almost no resource restrictions. (Example: IP cameras or smart meters based on 32-bit processors)

- Class 3 device: A device such as a smartphone or tablet with a class 2 or higher capability. Existing protocols are used, but most of the existing protocols can be used without changes or modifications.

In Table.1, SR-C, SR-I, SR-A and SR-AU means security requirement related on confidentiality, integrity, availability, and authentication/authorization, respectively.

Table. 1: Security Requirements by IoT Device Classification

	Security Requirements
Grade 0	2 security requirements applied [SR-C5] Management of identification information [SR-A2] Status information transmission
Grade 1	11 security requirements applied [SR-C1] Transmission message encryption, [SR-C3] Data encryption, [SR-C5] Management of identification information [SR-I1]Data Integrity [SR-A2] Status information transmission, [SR-A7] Software safety [SR-AU1] User authentication, [SR-AU2] Device authentication, [SR-AU3] password management,
	[SR-AU5] permission control, [SR-AU6]Access Control
Grade 2	Application of 20 security requirements other than the two below [SR-C2] Malware Response [SR-A3] Response to external attacks
Grade 3	All 22 security requirements applied

In this paper, we look at various security threats of IoT devices by layer, and then, with interest in the process of authenticating the communication target in 6LoWPAN communication based on IPv6, we looked at recent papers related to this.

II. IOT SECURITY ISSUES

First, we looked at studies that summarized IoT security issues. Among them, the IoT security issues discussed in [2] are summarized in Table2 so that you can see them at a glance.

Table. 2: IoT security issues

High-level security issues (Application layer)	CoAP security with Internet	It requires adequate key management and authentication mechanisms
	Insecure interfaces	The interfaces are vulnerable to different attacks which may severely affect the data privacy
	Insecure software/firmware	The software/firmware updates need to be carried out in a secure manner
	Middleware security	Different interfaces and environments using middleware need to be incorporated to provide secure communication
Intermediate-level security issues (Network Layer)	Replay or duplication attacks due to fragmentation	- Reconstruction of the packet fragment fields: depletion of resources, buffer overflows and rebooting of the device - Duplicate fragments sent by malicious nodes: hindering the processing of other legitimate packets
	Insecure neighbor discovery	Neighbor discovery packets without proper verification may have severe implications along with denial-of-service.
	Buffer reservation attack	sending incomplete packets results in denial-of-service
	RPL routing attacks	It results in depletion of resources and eavesdropping.
	Sinkhole and Wormhole attacks	These attacks have severe implications including eavesdropping, privacy violation and denial-of-service.
	Sybil attacks on intermediate layers	Sybil nodes using fake identities may result in spamming, disseminating malware or launching phishing attacks
	Authentication and secure communication	Any loophole in security at network layer or large overhead of securing communication may expose the network to a large number of vulnerabilities

	Transport level end-to-end security	It requires comprehensive authentication mechanisms which ensure secure message communication in encrypted form without violating privacy.
	Session establishment and resumption	The session hijacking with forged messages can result in denial-of-service
	Privacy violation on loud based IoT	This violates identity and location privacy may be launched on cloud or delay tolerant network
Low-level security issues (Physical and data link layer)	Jamming adversaries	IoT target deterioration of the networks by emitting radio frequency signals without following a specific protocol
	Insecure initialization	Physical layer ensures a proper functionality of the system without violating privacy and disruption of network services
	Low-level Sybil and spoofing attacks	random forged MAC values for masquerading as a different device while aiming at depletion of network resources
	Insecure physical interface	The poor physical security, software access through physical interfaces, and tools for testing/debugging may be exploited to compromise nodes in the network
	Sleep deprivation attacks	"sleep deprivation" attacks by causing the sensor nodes to stay awake, and it result indepletion of battery

As we have seen, security threats can occur in various ways at various layers, and our interest was in security attacks that can occur in an environment using IPv6 and their solutions. In particular, the idea of authentication to be considered in the IPv6-based network layer was further explored. Therefore in next section, we summarize several authentication methods for 6LoWPAN (IPv6 over WPAN) environments.

III. 6LOWPAN AUTHENTICATION

6LoWPAN provides the connectivity between IPv6 network and resource constrained devices. 6LoWPAN does not support any kind of authentication mechanism, and then any node can join the networks. Therefore, various studies have been conducted to solve this problem, and in this paper, we mainly look at recent papers.

3.1 ASCON [3]

Before looking at recent research, let's take a look at ASCON, which is widely used in various papers.

ASCON is a family of authenticated encryption designs $ASCON_{a,b}^{-k-r}$. The family members are parametrized by the key length $k \leq 128$ bits, the rate r and internal round numbers a and b. Each design specifies an authenticated encryption algorithm $E_{a,b,k,r}$ and a decryption algorithm $D_{a,b,k,r}$.

The inputs for the authenticated encryption procedure $E_{a,b,k,r}$ are the plaintext P, associated data A, a secret key K with k bits and a public message number (nonce) N with k bits. No secret message number is used, i.e., its length is 0 bits. The output of the authenticated encryption procedure is an authenticated ciphertext C of exactly the same length as the plaintext P, and an authentication tag T of size k bits, which authenticates both A and P:

$$E_{a,b,k,r}(K, N, A, P) = (C, T)$$

The decryption and verification procedure $D_{a,b,k,r}$ takes as input the key K, nonce N, associated data A, ciphertext C and tag T, and outputs the plaintext P if the verification of the tag is correct or $\perp$ if the verification of the tag fails:

$$D_{a,b,k,r}(K, N, A, C, T) \in \{P, \perp\}$$

3.2 S6AE [4]

S6AE verifies the legitimacy of SN(Sensor Node)s at the CS(Central Server), and validates the integrity and authenticity of messages exchanged between SNs and the CS in 6LoWPANs. In S6AE, after verifying the authenticity of SNs, CS and SNs establish secret keys using ASCON as the encryption scheme. SHA-256 is used to generate unique output strings by using the S6AE secret parameters, and bit-wise XOR operations are used to reduce the computational and storage costs.

In the performance evaluation, it includes very variable point-of-view analysis including security functionality, computational overhead, communication overhead, energy consumption, storage overhead, and handover phase overhead.

3.3 LAS-6LE [5]

LAS-6LE is divided into two phases, namely, (i) SN deployment phase, and (ii) AKE phase. LAS-6LE employs HF, XOR and ASCON. ASCON is an AE and LWC

mechanism, which ensures the authenticity and confidentiality of plaintext simultaneously.

They express the logical cryptographic operation of the ASCON encryption and decryption algorithm by *(CT, TAG) = E_{Si} {AD, PT}*, where S^i is the initialization sate of ASCON, which acts as a shared secret between SN and SR, and *(PT, TAG1)* =D_S^i{AD, CT}. And they evaluate the efficiency of the proposed LAS-6LE in terms of communication cost, compared with other ideas.

3.4 LC-DEX [6]

HIP DEX was standardized to be suitable with low power and resources constrained devices in IEEE 802.15 networks and used as a keying material in the MAC layer. Compared with the previous HIP-based solutions, it proposed an efficient compression header of HIP DEX protocol over 6LoWPAN in a T2T architecture. Evaluation results in terms of transmission delays during the handshake minimize considerably the communication overhead between the communicating peers (the initiator and the responder).

3.5 SLAP [7]

SLAP is a lightweight authentication protocol to enhance the security functionality of M2M communication in Industry 4.0. This minimizes the computational and communication overhead. It generates a shared secret key only after two rounds of communication and without any human intervention. Although SLAP uses only symmetric cryptographic operations, it ensures anonymity and untraceability in the secret key generation process.

It comprises two phases: Initialization phase, and Authentication phase.The initialization phase, the AS (Authentication Server) provides a secret key *PSK* to the controller via a secure channel and the controller securely stores the received *PSK*. Before a sensor is deployed, AS assigns a unique identity *IDs* to it. In authentication phase, the sensor and controller authenticate each other in 3-step handshaking, and share a *SK(session key)*between them for future communication.

The correctness of the proposed SLAP is verified using the BAN logic and using the AVISPA tool.

3.6 CATComp [8]

CATComp is a compression-aware authorization protocol for constrained application protocol (CoAP) and datagram transport layer security (DTLS) that enables IoT devices to exchange small-sized certificates and capability tokens over the IEEE 802.15.4 media. This proposes handshakes at the DTLS and CoAP layers that enable IoT devices to apply compression and decompression at the application and transport layers.And they design various messages that allow a sender device to negotiate a particular compression method with a receiver device while establishing a DTLS session.

IV. CONCLUSION

IoT devices conveniently provide various functions for a smart life, but there are many loopholes in security. In this paper, we looked at the security loopholes of IoT itself and looked at recent research on various authentication protocols in 6LoWPAN using IPv6. According to the result of the analysis of the thesis, it is possible to go through the authentication process for the communication target before starting communication, and to selectively apply an algorithm for data protection during communication. However, since IoT devices have hardware limitations, security design should be applied in consideration of device specifications and future maintenance. As the next study, we intend to design a protocol that is light enough to be used casually in IoT devices of various specifications and has good security effect.

ACKNOWLEDGEMENTS

This study is the result of research conducted by the professor's research year of Kumoh National Institute of Technology.

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INFOGAIN PUBLICATION

International Journal of Advanced Engineering, Management and Science (IJAEMS)
Peer-Reviewed Journal
ISSN: 2454-1311 | Vol-8, Issue-5; May, 2022
Journal Home Page: https://ijaems.com/
Article DOI: https://dx.doi.org/10.22161/ijaems.85.3

The Emerging Business among Pharmaceutical Companies: The Concept of Outsourcing to an Agency

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Received: 21 Apr 2022; Received in revised form: 10 May 2022; Accepted: 15 May 2022; Available online: 20 May 2022

Abstract— *This study aimed to determine whether outsourcing to a marketing agency will be beneficial to a pharmaceutical company. Marketing vis-a-vis to clients is one of the key elements to promote the pharmaceutical products. Under this setup, medical or pharmaceutical representatives are directly detailing to physicians to provide information about the products, while attending to their needs. The onset of COVID-19 pandemic halted these marketing activities of medical representatives, hence sales decreased tremendously. The study used purposive sampling that involved some 100 respondents through an E-survey directed at the marketing team of various pharmaceutical companies. Findings reveal that majority of pharmaceutical companies indeed practiced outsourcing their marketing activities which are incentive-based. However, respondents are complacent to fully adopt this model of full outsourcing for fear of losing their jobs. The effort of few isolated firms who employ individual medical representatives may not be enough if their motive is purely for profit. A contracted marketing agency or in a partner-agent model takes the responsibility for the delivery of the agreement under the production or incentivized scheme. While this saves on operational costs, price of medicines may increase. Consumers may suffer in the long term because marketing expenses are loaded as cost for the firm. Reduced workforce can also mean loss of jobs for those concerned.*

Keywords— ***Pharmaceutical Companies, Marketing, Outsourced Agency.***

I. INTRODUCTION

Pharmaceutical corporations have become more aggressive in their marketing and outreach to their primary clients, physicians, in recent years. R. Stephen Parker, DBA, and Charles E. Pettijohn, DBA, published Pharmaceutical Drug Marketing Strategies and Tactics: A Comparative Analysis of Attitudes Held by Pharmaceutical Representatives and Physicians. To boost sales of pharmaceutical medications, a variety of promotional tactics have been tried. Push approaches have always been the most common method of encouraging physicians to prescribe medications and so increase revenues. Direct-to-consumer advertising is increasingly being used to urge patients to ask their doctors for marketed medications.[1] They've used tried-and-true strategies and tactics like celebrity endorsements, round table discussions, billboards, brochures, and attending seminars and conventions where prescribing doctors are known to congregate. [20,14]

Deloitte previously discovered that pharmaceutical digital advertising and marketing spend trails far behind all other industries. According to this survey, the financial services sector spent $6.2 billion on digital advertising in 2014, compared to $1.4 billion in

healthcare and pharmaceuticals. According to a more recent analysis, this spending climbed to $2.53 billion in 2017, although it still exceeds other businesses, which are typically in the double digits by 2018. Pharma's conventional nature may be limiting its marketing activities' potential, with money sometimes being directed to more traditional means and digital opportunities not being fully exploited. Of course, the pharmaceutical business is embracing more and more digital efforts, but as we have seen in the past, it is always one step behind, posing a difficulty for marketers.[18]

However, there is a new technique on the horizon that has the potential to increase sales while lowering costs through more efficient marketing. A new outsourcing agency marketing business concept or model is comparable to that of insurance businesses, which outsource their employees and solely benefit based on the number of sales they can bring in over a set period.

II. STATEMENT OF THE PROBLEM

With the advent of the global pandemic and the introduction of quarantine protocols, client accessibility has been severely limited. The goal of this research is to look for a new potential marketing strategies with the goal of increasing overall profit and customer access in time. The research sought to answer the following:

1. What strategies are utilized by pharmaceutical companies to increase sales and production while increasing overall profit during the pandemic?
2. Why can outsourcing to an agency benefit the sales of a pharmaceutical company?
3. How can an incentive percentage or commission-based model benefit pharmaceutical companies?

III. CONCEPTUAL FRAMEWORK

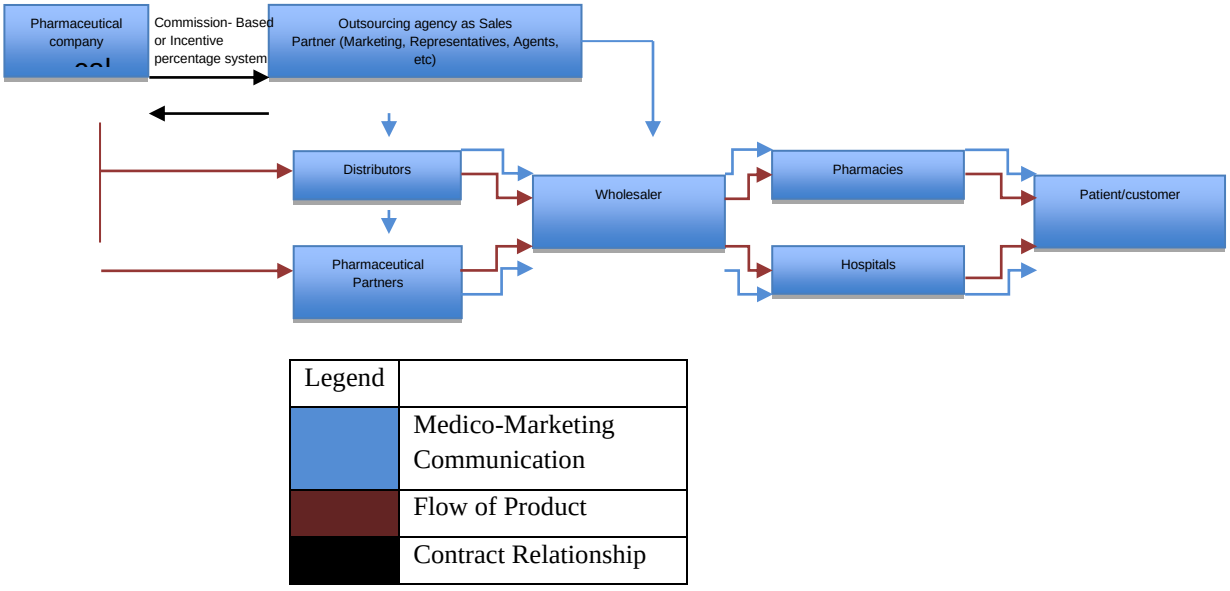

Fig.1: Conceptual Framework of the study

Figure 1 illustrates the conceptual framework of the study. This shows the relationship between a new outsourcing agency marketing business concept or model and how it would affect the pharmaceutical company's sales. Outsourcing to an agency is a novel approach in the pharmaceutical industry for incorporating a commission-based sales model. With this relationship, outsourcing can promote efficient marketing while the pharmaceutical companies increase sales while minimizing on upfront costs.

With the pandemic, this marketing strategy will provide a direct marketing communication between the marketing representative in an outsourced agency and the potential customer with the pharmaceutical company regulating the flow of product. The conceptual framework of the study is inspired from the partner-agent model which shows the relationship between the company, the

agent, and the client. [30] This strategy improves competence as it is a commission-based model based on sales performance which attracts more profit and customer reach, as well as a platform to discuss more factors of the approaches that can be implemented into the new strategy to improve its efficiency. This model ensures the company is viable during this pandemic, as it is also flexible to respond to changes in the market and that all the elements are working cohesively together to make a profit.

IV. METHODOLOGY

The research instrument employed in this study was an E-Survey or online survey. This was utilized to effectively collect data from participants without violating quarantine protocols and ensuring the safety of both the respondents and the researchers of this study. This involved 100 pharmaceutical company representatives.

The technique used in this study was purposive sampling wherein the researcher sets a criterion that the sample population must be able to conform to the data they will be contributing to be valid. The following are the criteria for the sample group:

1. Must be working in a Pharmaceutical Company
2. Must have an experience in Marketing Division
3. Preferably a member of the upper management

V. RESULTS AND DISCUSSION

1. What strategies are utilized by pharmaceutical companies to increase sales and production while increasing overall profit?

Table 1. Strategies used by pharmaceutical companies

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a.	Considered fully utilizing a third-party marketing agency	50%	50%	0%	0%	0%
b.	On top of the commission entered by and between parties can elevate incentives over and above the amount stipulated in the contract	40%	60%	0%	0%	0%
c.	For the company to just maintain core workforce instead of retaining them will encourage outsourcing	20%	50%	10%	20%	0%
d.	Incentivized agreement can be more convenient as this saves on operational costs	70%	20%	10%	0%	0%

Table 1 shows that most of the respondents strongly agreed that the best strategy that the pharmaceutical companies should use in order to increase sales and production while increasing overall profit is to provide incentives, because it is more convenient as this will saves on operational cost. Majority of the respondents agreed on maintaining the core workforce because the setup may be disadvantageous to them or fear of losing their jobs. However, most of the pharmaceutical companies also offer incentives on employee's production as they are also tasked to sell the product so that the purpose is double; monthly salary and the incentives they will get from selling the product.

2. How can outsourcing to an agency benefit the sales of a pharmaceutical company?

Table 2. Advantages in outsourcing to an agency

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a.	A marketing agency has to hit the target sales as agreed upon in the contract	50%	50%	0%	0%	0%
b.	Incentives are based on production that a third-party agency will make advantage to earn more than its sales force	40%	60%	0%	0%	0%
c.	Agency/ies contracted prefer this kind of arrangement as this model is more efficient, and is more profitable for	20%	50%	10%	20%	0%

	the parties involved					
d.	Commissioning a third-party marketing agency will have to maintain a certain sales target as it determines everyone's survival	70%	20%	10%	0%	0%

Table 2 shows that almost three-fourths of the respondents strongly agreed that commissioning a third-party marketing agency will maintain a certain sales target as it determines everyone's survival. While few of them strongly agreed that contracting to an agency is more efficient model and is more profitable for the parties involved. It can be noted of the complacency of the respondents to fully utilize total outsourcing to a marketing agency for its operational activities for fear of losing their jobs.

3. How can an incentive or commission-based model benefit pharmaceutical companies?

Table 3. Benefits of commission-based model to pharmaceutical companies

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a.	Commission-based incentives can be more efficient than the traditional setup i.e., salaried monthly employees	50%	50%	0%	0%	0%
b.	A more robust sales commensurate to production assures the pharmaceutical company of a bigger profit	40%	60%	0%	0%	0%
c.	All things being equal, terms and conditions in the agreement benefit more the pharmaceutical company	40%	50%	10%	0%	0%
d.	Any savings as a result of efficient operational costs will mean more profit for the pharmaceutical company	70%	20%	10%	0%	0%

Table 3 suggests that most of the respondents strongly agreed that a lot of operational costs can be saved if pharmaceutical companies would be more efficient in its marketing and selling activities. Most of the respondents agreed that the terms and conditions in the agreement will be more beneficial to the pharmaceutical companies. Hence, it becomes profitable more on the pharmaceutical companies in adopting to full outsourcing of its marketing and selling activities. Under this model, core functions of the organization are retained and maintained. However, there is no guarantee that any company for that matter may also be inclined to subscribe to full outsourcing.

VI. CONCLUSION AND RECOMMENDATIONS

Some pharmaceutical firms were compelled to outsource their marketing and their selling activities to a third-party agency or agencies especially during the pandemic where movement of people was restricted and face-to-face was discouraged then. This arrangement can be more advantageous especially on the part of pharmaceutical firms where profit is the motive. Respondents may not totally agree to this kind of arrangement for fear of stealing part of their commission through a third-party where a contract. The pressures as a result of massive advertisement can make the price of medicines more expensive. It is recommended that pharmaceutical firms should make a balance in adopting this kind of model which in most cases is profit-motivated to the disadvantage especially on the part consumers. Corporate social responsibility will take a backseat here at it depends on the company since there is no law that would otherwise force to practice such. Being sick in this country can cost a fortune even with the presence of a government healthcare program. While this business model can be efficient, there is no guarantee that pharmaceutical firms will not be inclined for the total outsourcing model.

ACKNOWLEDGEMENTS

We would like to convey our heartfelt appreciation to our research adviser, Dr. Felipe Balaria, Chairman Business Administration Department, for providing us with the chance to conduct this research, and for offering vital advice during this process. His energy, vision, genuineness, and motivation have left us in awe. He taught us the approach for doing the study and presenting the findings as plainly as possible. Working and studying under his supervision was a wonderful

honor and a great privilege. We are tremendously appreciative for what he has done for us.

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INFOGAIN PUBLICATION

International Journal of Advanced Engineering, Management and Science (IJAEMS)
Peer-Reviewed Journal
ISSN: 2454-1311 | Vol-8, Issue-5; May, 2022
Journal Home Page: https://ijaems.com/
Article DOI: https://dx.doi.org/10.22161/ijaems.85.4

Computer-assisted academic methods: determining the methods of teaching to higher education students

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Received: 19 Apr 2022; Received in revised form: 12 May 2022; Accepted: 16 May 2022; Available online: 20 May 2022

Abstract— *This work aims to investigate different teaching methodologies for university students, although legislation mandates that students with autism receive instruction linked to the general education core content, there is limited research supporting the effectiveness of interventions for teaching core content to these students. The current study was conducted at private universities. A quantitative way for analyzing this paper. In order to analyze this study, a questionnaire was carried out. 180 questionnaires were distributed, 171 were received, however of the 162 questionnaires were properly filled. According to multiple regression analyzes, computer-assisted academic method had the highest value. A computer-assisted academic lecture is one of the ways that can achieve educational objectives.*

Keywords— ***higher education, pedagogy, academic methods, computer-assisted academic method.***

I. INTRODUCTION

The Teaching Ethics course to university graduates requires certain tactics to make them aware, apart from technical capabilities (Khan & Abdullah, 2019), of the necessity to be ethical (Paschal et al. 2022). The task of communicating ethical ideals in the minds of students through curricula from various fields (Sohail & Nabaz, 2019) lies with subject matter experts as well as faculty members who teach this specific course (Riyadh et al., 2020). Teaching options for graduate students' ethics are standard lectures (Darbandi, 2017), role-playing, case study and help from professionals with professional ethics difficulties (Sultan et al., 2020). The research also identifies the teaching ethical process (Yaba et al., 2021). According to Mahmood et al., (2022), the use of ethicalists has knowledge and finite resources complications can be helpful (Hassan & Ahmed, 2020). It is recommended that a professor in the discipline involved may be trained and prepared for the duty of teaching ethics (Sadq et al., 2020). Accounting faculty member in business training is competent for teaching (Ahmed & Hassan, 2019). As members in an ethical organization (Khorsheed et al., 2020), organizations are not obliged to participate which effect individual ethical behavior within the organization (Sadq et al., 2020). The American Institute of Public Accountants Certified (AICPA) has provided Certified Professional Accountants (CPA) and its members (Khan, 2021) with rules on ethics (Mohammed, 2019). While drawing up the ethical guidelines of organizations that oversee the business (Othman et al., 2020), it was considered how decision makers and end users of the sector observe a particular profession (Mohammed et al., 2020). According to Aziz et al., (2021), it would be conceivable to include ethics courses in the curriculum for university graduates in two ways (Qadir et al., 2021). One option is to teach separate courses, which are individually personalized (Mohammed, 2021). The second option (Kareem, 2020) is to teach ethics across the curriculum (Riyadh et al. 2020), which requires a professor who teaches this particular course to know about it (Jamal, 2021). According to Fatah et al., (2021), the Academy of Accounting (Saadi, 2021) has reduced its expertise and recommended finding strategies to teach ethics to teach them (Ismeal et al., 2021). The Sirotnik Teacher Education (1990) is a method in which moral character is bestowed rather than competence and expertise (Hamad et al., 2021), where both are vital (Abdalla Hamza, et al., 2021). Ethics can be easily taught when a pupil is expected to perform rather than simply memorize him/her (Karem et al., 2021). Many experiments

and theories have been developed on teaching students and bringing actual value from students (Hamad et al., 2021).

II. LITERATURE REVIEW

Education and educational methodology are diverse (Khan, 2021), but they all share a fundamental common notion: that the student comprehends (Mohammed, 2017) the concept (Abdalla Hamza, et al., 2021), applies it in real life and adheres to the ethical norms in the subject matter chosen (Hamad et al., 2021). According to Sharif & Azeez, (2021), instructors who prepare ahead of time get better outcomes than teachers who use standard procedures (Dixit & Sharif, 20219). According to the findings of McGee and Bruce Howard's research, conventional tactics do not foster a competitive climate or a sense of class as a whole (rzgar Ahmed & Sharif, 2018). It is possible that a single teaching strategy will not be sufficient to meet all of the students' solo requirements since they will have multiple questions about teaching topics and their attention will be divergent (Sultan, 2021). The goal of any student assessment strategy is to (Rezaei et al., 2019) ensure that the student grasps the idea rather than measuring their ability to recall the subject matter, as is the case with traditional tests (Saleh & Jamil, 2017). Learning activities that influence various types of knowledge creation as well as student engagement in the course curriculum, according to Nithyanantham et al., (2019), would play a critical role in attaining learning outcomes in a technologically oriented context (Al-Yousuf et al., 2020). Several researchers, including Alyousuf & Din, (2022), assert that students and instructors, via education as a medium, have an impact on one another's life (Ali & Ebraheem, 2022), with others participating in this process (Mardan & Ahmed, 2017). A student's ability to think critically and be aware of ethical issues (Sadq et al., 2018) is vital both throughout his or her academic career and when he or she becomes a member of a professional organization, as described in the previous section (Kareem et al., 2022). According to Wu et al., (2022), students are given ethics-centered courses that will prepare them for difficult options, and they should (Mohammed & Ahmed, 2018) be interested in knowing the facts of a problem in order to make informed decisions (Qasim & Alyousuf, 2021). According to the definition of ethics in education (Sharma et al., 2022), the action of individuals to offer human beings with a benefit is the nature of ethics (Mohammad, 2021). Consumers will make fundamental requests as a result of a person's participation in a profession (Awdel et al., 2020), and the needs and interests of customers take precedence over the requirements of the supplier (Sultan, 2021). Parents and relatives are accountable (Dixit & Sharif, 2020) for a student's moral training from an early age (Saadi, 2021), which will result in the student's excellent conduct toward parents and other people (Qoitassi & Sharif, 2015). According to Sharif, (2017), codes may influence employees' decision-making and shape their ethical behaviour in a variety of situations (Fallahi et al., 2019).

Although education and educational methods are various, there is a general belief that students must understand, apply, and adhere to the ethical principles in the subject matter they are studying (Jamil et al., 2018). Teachers who plan ahead of time have greater results than those who follow the same routine, according to (Jamil & Mawlud, 2021). There is little evidence that traditional techniques generate a competitive atmosphere or a feeling of class overall, according to McGee and Howard's study (Saleh & Jamil, 2021). One teaching technique may not be adequate to address the needs of all students in a one-on-one setting since students may have a variety of questions and their focus may be divided (Qasim et al., 2020). Student evaluation strategies are designed to guarantee that students understand rather than just measure their capacity to remember information, as in conventional assessments (Ahmed & Mohammed, 2019). As stated by Mohammed et al., (2018), in a technologically driven setting, learning activities that affect different forms of knowledge development and student participation in the course curriculum play an important role in reaching learning objectives (Birdawod et al., 2018). According to a number of studies, including Alyousuf et al., (2020), students and instructors have an influence on one another's lives via education as a medium (Cao et al., 2021). Crucial thinking and an awareness of ethical concerns are critical for students throughout their academic careers as well as when they join professional organizations, as discussed in the preceding section (M Aziz, 2016). Ibrahim et al., (2020) claim that the ethics-centered courses in 2022 will prepare students for tough choices, and they should (Prakash et al., 2020) be engaged in the facts of a situation so that they can make educated judgments (Manikandan et al., 2020). Ethicists are defined as those who take action to help others, as defined by the concept of ethics in education (Cao et al., 2022). Customer wants and interests take priority over the needs and requirements of the provider when a person is engaged (Sharma & Kumar, 2021) in a professional activity (Balaji et al., 2019). To ensure that their children have the best possible relationship with their parents and other family members, parents and relatives have a responsibility (Mohammed et al., 2018) to instill good morals in them from an early age (Mohammed et al., 2018). Sharif claims the following (Ahmed et al., 2021): Conventions may impact workers' decision making and ethical behavior in many scenarios (Cao et al., 2022).

Students are expected to comprehend (Paschal & Mkulu, 2020), apply, and adhere to ethical concepts in the subject matter they are learning (Sohail & Dhuha, 2020), despite the fact that educational institutions and teaching techniques vary widely (Fareed et al., 2021). According to research, teachers who prepare ahead of time get better outcomes than those who stick to the same pattern every day (Khan et al., 2022). According to McGee and Howard's research, there is no evidence that conventional approaches foster a competitive climate or a sense of social class in general (Saleh & Jamil, 2021). In a one-on-one scenario (Mahona & Pacho, 2021), one teaching style may not be sufficient to meet the requirements of all pupils since they may have a range of questions and their attention may be split (Sivaram et al., 2020). Student evaluation procedures are intended to ensure (Paschal & Mkulu, 2020) that students comprehend rather than just test their ability to recall knowledge, as is the case with traditional examinations (HamaAliFaraj et al., 2017). According to Rashid et al., (2019), in a technologically driven environment, learning activities that influence multiple kinds of knowledge acquisition as well as student engagement (Benedicto & Paschal, 2022) in the course curriculum play a significant role in meeting learning goals (Birdawod et al., 2018). According to a number of studies, including Sharma et al., (2020), students and instructors have an impact on one another's life via the medium of education (Awasthi & Sharma, 2020). As previously noted in the preceding section, critical thinking and a knowledge of ethical problems are essential for students throughout their academic careers as well as when they join professional groups after graduation (Gowsic et al., 2019). Sharma et al., (2019) assert that students will be prepared for difficult decisions in the ethics-centered courses offered in 2016, and they should (Awasthi et al., 2019) be engaged in the facts of a situation so that they can make informed judgements about those facts (Othman et al., 2018). In accordance with the notion of ethics in education, ethicists are individuals who take action in order to benefit others (Sharma et al., 2022). According to Paschal, (2022) when a person is involved in a professional activity, the demands and interests of the customer take precedence above the needs and requirements of the service provider (Abdulsamad et al., 2022). Parents and relatives have a duty (Ali & Yahiya, 2018) to teach excellent values in their children from an early age in order to guarantee that their children have the best possible connection with their parents and other family members (Honarbakhsh et al., 2022).

The fields of education and methodology in education may be varied (Abdalla Hamza, et al., 2021), but they all share the fundamental common notion that the student understands (Shareef et al., 2021) the idea (Kangarluei et al., 2012), uses it in real life and follows the ethical norms in the subject chosen (Sultan et al., 2020). According to Khan et al., (2019), teachers planned in advance give higher results than ordinary techniques (Khan et al., 2020). Research by (Sharma & Ismail, 2022) McGee and Bruce Howard emphasized that traditional approaches do not create a competitive environment and class as a whole (Sadq et al., 2020). The students' solitary demands may not be satisfied by a single technique of teaching since they have numerous queries with relation to teaching concepts and their attention will be divergent (Qader et al., 2021). The objective of any student evaluation approach is to (Sharma et al., 2022) make the student grasp the concept instead of testing their memory's capacity to retain the subject like (Mohammed, 2019). According to Sadq et al., (2020), learning tasks that affect different kinds of knowledge production and student participation in the course curriculum would be the key role in obtaining learning results in a technologically oriented setting (Majeed et al., 2021). According to Mohammed et al., (2022), students, teachers, through education as a media, affect each other's lives (Ali & Ebraheem, 2022), while others participate in this process Rashid, (2022). A student has to have critical thinking and awareness of ethical concerns that are crucial for him/her during his/her studies and when he/she becomes a member of a professional organization (Qader et al., 2021). Aziz et al., (2021) indicated that students are taught ethics-centered courses that will prepare them for tough alternatives and that they should (Khan & Zada, 2021) have an interest in learning facts of dilemma (Sorguli et al., 2021). The character of ethics in education is the behavior of persons to provide human beings with a benefit according to (Sabir et al., 2021). The membership of persons in a profession will involve customers in making basic demands, and the demands of customers and interests are paramount than the requirement of the provider (Hamza et al., 2021). Gardi et al., (2021), parents and relatives are responsible (Khan, 2021) for a student's moral instruction early on, which will lead to the student's wonderful behavior towards parents and other persons (Harouache et al., 2021). Kadhim et al., (2021) has concluded that codes can guide employee decision-making and shape their ethical conduct (Abdalla Hamza, et al., 2021).

III. METHODOLOGY

Design of the study

To assess the current study, the researchers used a questionnaire. Divided into two main areas, the first part was demographic analysis, beginning with the age, gender and level of education of the respondents. The second questionnaire consisted of four sub-sections; the first sub-section dealt in case study as a dependent factor; the second

with the traditional lecture teaching method as an independent variable; the third sub-section with the method of teaching the assignment; and the last sub-section with the course in business ethics as a dependent variable.

Sampling Size

The research sample was recruited using a random sampling approach. The aforementioned random selection took place in private university. In the private university, a total of 170 questionnaires were distributed, 158 were received, but only 146 were valid and fully completed out of 158 questionnaires. The data have been obtained in hard copies.

Instrument for measuring (scales)

In order to explore the feature of business ethics learning, this study investigates the evaluation of the teaching method of case study, the traditional teaching technique, the technique of teaching and the course on business ethics study. Participants were asked to assess how strongly they agree on five ordered measures in each question. The scale of business ethics learning as a dependent variable was measured and evaluated on a 5-point scale, where potential responses vary strongly to the same scale, and the scales for the case study method, traditional teaching method, and assignment teaching method were measured on a five-point ordered scale, which provided possible answers. These tools were proven by previous scientists to be excellent for the study of instructional practices (Marmah, 2014) and (Ismail, 2014).

Research hypotheses

According to the above research model, the researchers set the following research hypothesis: H1: There is a positive association between case study teaching method and learning business ethics course.

H2: There is a positive association between traditional lecture teaching method and learning business ethics course.

H3: There is a positive association between assignment teaching method and learning business ethics course.

IV. DATA ANALYSIS AND RESULTS

The purpose of this study is to measure the relation between teaching strategies (case study teaching method, traditional lecture teaching method and assignment teaching method) with learning business ethics course in private university. As it mentioned previously total of 146 participants were involved in completing the survey. These respondents had different level of education some respondents were from first year, some from second year, third year and others from fourth year. The current study deals with learning business ethics and teaching strategies in education sectors, the teaching strategies criteria to examine were identified as case study teaching method, traditional lecture teaching method and assignment teaching method. The participants were asked to rate how important they perceived each item on five point ordered scales. The scales for engineer performance was measured and evaluated on a five point scale with potential answers ranging from strongly disagree to strong agree. The scales for training, performance evaluation, compensation, promotion and participation were measured as well on a five point ordered scale which however gave possible answers ranging from strongly disagree to strongly agree. The following tables show the statistical results of this study using SPSS program:

Demographic Analysis

Table 1 Demographic Analysis

Items		Frequency	Percent
Gender	Male	84	57.5
	Female	62	42.5
Age	20-21	13	8.9
	22-23	77	52.7
	24-25	49	33.6
	25+	7	4.8
Level of education	Second year	37	25.3
	Third year	76	52.1
	Fourth year	33	22.6

Table 2 Reliability Analysis

Factor	Cronbach's Alpha	Number of items
Case study method	.768	9
Traditional lecture method	.867	7
Assignment method	.608	7
Business ethics	.913	9

As seen in the table (2), the reliability analysis for case study method, traditional lecture method and assignment method as independent factors, on the other hand, business ethics course for business department students as dependent factor. According to the reliability statistics test, the researchers found out Cronbach's Alpha for case study teaching method =.768 for which is greater than .7 this means that items of case study teaching method factor was reliable for this study, Cronbach's Alpha for traditional lecture teaching method =.867 for which is greater than .7 this means that items of traditional lecture teaching method was reliable for this study, Cronbach's Alpha for assignment teaching method =.608 which is greater than .7 this means that items of assignment teaching method was reliable for this study and Cronbach's Alpha for business ethics course=.913 7 this means that items for the business ethics course was reliable for this study.

Table 3 Correlation Analysis

Correlations				
		Case study method	Traditional lecture method	Assignment method
Business ethics	Pearson Correlation	.156**	.519**	.153**
	Sig. (2-tailed)	.059	.000	.066
	N	146	146	146
****. Correlation is significant at the 0.01 level (2-tailed).**				

As seen in table (3), R=.156** for case study teaching method factor, this means that case study teaching method has weak correlated with business ethics course, R=.519** for traditional lecture teaching method factor, this means that traditional lecture teaching method has significantly correlated with business ethics course and R=.153** for assignment teaching method factor, this means that assignment teaching method has weak correlated with business ethics course. According to the above table, the researchers concluded the strongest correlation and the highest value among all factors was traditional lecture teaching method which =.519**.

Table 4 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.524[a]	.275	.260	.90001
a. Predictors: (Constant), assignment, traditional, case				

Regression analysis is analyzing relationships among factors. Y=f(x1, x2…XC). Regression analysis is to estimate the how Y will influence and change X and predict. In this research case study teaching method, traditional lecture teaching method and assignment teaching method are independent variables and business ethics course is dependent. The business ethics course' overall difference could be measured by its variance. The differences are measured as the sum of the square between participant's forecasted business ethics course values and the total mean

divided by the number of participants. After division it will clarify variance by the total variance of business ethics course, the researchers found out the amount or the number of total difference or variance that is accounted based on regression calculation. The number should vary between 0 -1 and is symbolized by R Square. Table (4) shows the value of R square = .275 this indicates that 27.5% of total variance has been explained.

Table 5 ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.592	3	14.531	17.939	.000[b]
	Residual	115.022	142	.810		
	Total	158.614	145			

a. Dependent Variable: ethics

b. Predictors: (Constant), assignment, tradition, case

As seen in the above table (5), F value for case study teaching method, traditional lecture teaching method and assignment teaching method as independent variable =17.939, since (17.939>1) this indicates there is a significant relation between all independent variables (case study teaching method, traditional lecture teaching method and assignment teaching method) and dependent variable which is business ethics course.

Table 6 Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.251	.431		2.905	.004
	Case Study	-.022	.098	-.020	-.224	.823
	Traditional Lecture	.650	.094	.511	6.912	.000
	Assignment	.099	.102	.083	.971	.333

a. Dependent Variable: ethics

As seen in the above table (6), the result of three hypothesis, case study has not predicted business ethics course (Beta is weight –0.20, p>.001) this indicates that case study teaching method will not have any association with learning business ethics course, accordingly the first research hypothesis was rejected. According to traditional lecture teaching method has significantly predicted learning business ethics course (Beta is weight 0.511,p.001) this indicates that assignment teaching method will have a weak positive association with learning business ethics course, accordingly third research hypothesis was supported.

V. CONCLUSIONS

The study has proved the extensively held opinion that the traditional lecture method will pursue to be the principal method of teaching in education sectors (Khan & AAS, 2019). According to multiple regression analysis, the researchers found out that the highest value and the most dominant teaching method was traditional lecture method. The findings of this study proved the strongest relation between traditional lecture teaching methods with learning course (Sohail & Dhuha, 2021). Also, based on multiple regression analysis, the researchers were able to test the research hypothesis; the first research hypothesis; case study teaching method has a positive association with learning business ethics course, the finding of this study revealed that case study teaching method has not predicted business ethics course (Beta is weight –o.20, p>.001) this

indicates that case study teaching method will not have any association with learning business ethics course, accordingly the first research hypothesis was rejected. The second research hypothesis; traditional lecture teaching method has positive association with learning business ethics course, the finding of this study revealed that traditional lecture teaching method has significantly predicted learning business ethics course (Beta is weight 0.511,p.001) this indicates that assignment teaching method will have a weak positive association with learning business ethics course, accordingly third research hypothesis was supported.

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INFOGAIN PUBLICATION

International Journal of Advanced Engineering, Management and Science (IJAEMS)
Peer-Reviewed Journal
ISSN: 2454-1311 | Vol-8, Issue-5; May, 2022
Journal Home Page: https://ijaems.com/
Article DOI: https://dx.doi.org/10.22161/ijaems.85.5

On Ideological and Political Education in Translation Teaching from the Perspective of Building a Community with a Shared Future for Mankind[1]

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Received: 22 Apr 2022; Received in revised form: 15 May 2022; Accepted: 21 May 2022; Available online: 27 May 2022

Abstract— *Building a community with a shared future for mankind is a new solution to global governance offered by China in the new era. In view of this national strategy, foreign language education should not focus only on skills learning, but also on moral education. Translation studies provide rich elements of moral education for Ideological and Political Education (IPE), such as translation theory, translation examples and translators' professional qualities. The paper proposes the principles and practices of integrating IPE into translation teaching. Besides, the Chinese-English Translation Course from Foreign Language Schools of Zhejiang University of Finance and Economics Dongfang College is exemplified to show the whole process of integration.*

Keywords— ***A community with a shared future for mankind, IPE, Chinese-English Translation Course.***

I. INTRODUCTION

Building a community with a shared future for mankind is a new solution to global governance offered by China in the new era. It is an ideological guide for the new era in view of challenges in global development and global governance system. The multi-polarization structure and common development trend of the world today have deconstructed west centralism. To regard the development of human beings is a scientific outlook. At the heart of the concept of a community with a shared future for mankind is the belief that "the world is one family." This belief derives from essential elements of Chinese traditional culture. Since ancient times, China has been known for its pursuit of a just cause for common good, the fraternal spirit of its people, and the ideal of building harmony and cohesiveness in the world. While at present, international relations are complex, and cultural development shows a trend of diversification. One of the basic relationships in building a community with a shared future for mankind lies in the diversity and unity of human civilization. Chinese president Xi Jinping stressed that in building a community with a shared future for mankind, we should transcend the estrangement of civilizations through exchanges, transcend the clash of civilizations through mutual learning and transcend the superiority of civilizations through coexistence. The communication of civilization is the communication of different languages, cultures, and ideas. In the context of the new era, foreign language education should promote cultural exchange and equal dialogue between China and foreign countries, thus promoting the construction of a

[1] A Project Supported by Zhejiang Higher Education Association Independent Colleges Branch (浙江省高等教育学会独立学院分会)

community with a shared future for mankind.

In recent years, there have been many discussions on foreign language education in the new era. In the light of the latest PISA Global Compliance Framework published by the Organization for Economic Co-operation and Development (OECD), Mei (2018) holds that foreign language education should not only help students improve language competence, more importantly, it also needs to develop students' emotions, attitudes, and values needed to build a community with a shared future for mankind. Hong (2019) further elaborates on the concept of global literacy of foreign language talents based on the concept of a community with a shared future for mankind and points out that foreign language institutions should foster students' deep sense of identity and pride in Chinese traditional culture. Foreign language talents should be able to spread Chinese excellent traditional culture to the world and take part in global governance with Chinese wisdom. Yang & Shen (2019) suggest highlighting all-round development in foreign language education is an important way to build a community with a shared future for mankind. And to achieve all-round development for foreign language majors, the teaching practice, textbook design and evaluation system should be improved. The Ministry of Education (2020) pointed out in the "Guidelines for the Ideological and Political Construction of Higher Education Curriculum" that the fundamental task of cultivating moral integrity should be carried out in all corners of the country, and ideological and political work should be carried out in all institutions of higher learning and all disciplines throughout the country. The importance of value-building should be emphasized in the trinity of value-building, knowledge teaching and ability training in colleges and universities. As far as the foreign language subject is concerned, foreign language learning is not only the acquisition of foreign language knowledge and communicative competence, but also the process of the formation and shaping of students' cultural identity, values and characters.

II. THE INTEGRATION OF IPE INTO CHINESE-ENGLISH TRANSLATION COURSE

In contemporary China, IPE plays an important role in influencing the world views and political beliefs of students. Zhang (2015) points out that IPE is one of the basic carriers and realization forms of conducting and developing Chinese mainstream culture and ideology. Since the goal of Chinese higher education is to "cultivate the builders and successors of socialism for the future" ((National People's Congress [NPC], 2015), IPE is a key factor to contribute to this goal. President Xi (2016) reinforced the importance of IPE in other specialized courses by stressing that IPE in universities should be integrated into the whole education process of Higher Education. And in February 2017, the CPC central committee and the state council emphasized that ideological education should be carried out in the whole process and every link of teaching to form a long-term mechanism of teaching (The Central Committee of CPC and the State Council, 2017).

2.1 The Connotation of Integrating IPE into Translation Teaching

Chinese-English Translation is a compulsory course for English majors in Chinese universities, and it is also a course that involves languages and cultures. The "culture turn" in translation studies since the 1990s has placed greater emphasis on the culture aspect in translation. Translation is emphasized as a cross-cultural act of interpretation, and the historical mission and function of translation in the context of globalization is that translation can cross cultural boundaries. The translator's high cultural awareness is the key to building China's international influence (Chen, 2013: 100). The nature of translation and the focus on translators also have enlightening effects on translation education in the context of an ever-connected world. It can be said that translation teaching should not only cultivate students' language skills, but also cultural consciousness and value orientation. And the essence of IPE is the practice of integrating certain ideas, political awareness, ethics into students' moral building. Translation is the communication of the meaning of a source-language text by means of an equivalent target-language text, and a qualified translator should not only have a good command of both source and target languages, but also a high degree of responsibility and he should always bear the best interest of his nation in mind. A translator should not only have a firm political stand, but also maintain a high degree of political sensitivity and strong patriotic enthusiasm, so as to safeguard the dignity of the state.

2.2 The Principles of Integrating IPE into

Translation Teaching

Firstly, we should combine the teaching materials of IPE into translation teaching materials, focusing both on the talents training and moral building. The quality of teaching lies in the choice of teaching content, which hinges on the choice of teaching materials. For example, *The Governance of China*, a three-volume collection of speeches and writings by Xi Jinping, works as a good translation teaching material. *Governance of China* consists of 270 pieces, organized thematically into 54 chapters. The text articulates President Xi Jinping Thought, Xi's political philosophy as it relates to large-scale political issues concerning China including economics, domestic politics, international relations, infrastructure, technology, environmentalism, peaceful co-existence, and the military. Volume I also contain a political biography of Xi in the appendix. By studying the source and target texts, students could understand the great achievements China has made in economic, political, cultural and social development since the reform and opening up, thus cultivating their patriotism. In order to meet the needs of the society and industry for translators, we should cultivate students' sense of service and dedication.

Second, a great importance is attached to the combination of an explicit translation learning and implicit IPE. One of the fundamental principles of integrating IPE into specialized courses is that the content of ideological and political education in professional courses should be implicit. The implementation of IPE in translation course should be based on the realization of the language objectives, such translation skills training and translation methods learning. Explicit teaching refers to the study of the course prescribed by the course curriculum, while implicit teaching refers to the activities arranged by the teachers. In the course, a variety of activities such as translation project, lectures, volunteer service, translation competitions belong to the implicit teaching. The principle of combining explicit and implicit teaching could date back to the study by American education sociologist Jackson. Jackson (1968: 33-35) in his "Life in the Class" refers the cultural acquisition as implicit teaching, including unplanned knowledge, values, norms and attitudes that students learn in the class. By so doing, we could cultivate a high sense of responsibility and a correct outlook on life in the students, and build an educational system featuring all-round development.

III. A CASE STUDY: INTEGRATING IPE INTO THE CHINESE-ENGLISH TRANSLATION COURSE

Chinese-English Translation Course is a compulsory course for the third-year English majors in Zhejiang University of Finance and Economics Dongfang College, with a total of 64 class hours and 4 credits. The main purpose of the course is to improve students' Chinese-English translation skills. It aims to lay the translation basics needed for advanced translators by engaging students in various translation training. Besides, the course also aims to enhance the cultural awareness and intercultural communication ability in students. The following section will show how the integration of IPE is carried out in this course.

3.1 Teaching Resources

In terms of teaching resources, the course aims to create an effective teaching mode to achieve the aim of combining translation teaching with IPE. Qiu (2018: 104) believes that to maintain the concordance of IPE and professional training, we should consider the dimensions of cultural and national identity. In the light of these dimensions, the ideological and political resources of translation can be explored from the following three aspects: the teaching of translation theories, the introduction of translation cases, and the emphasis on translators' professional quality.

Compared with Western translation theories, traditional Chinese translation theories contain deep Chinese philosophy and wisdom. Chinese translation theories originated from Chinese classics and traditional philosophies and have been developed by numerous translators. Most scholars hold that China hasn't developed any systematic translation theory, but in fact China has formed a series of translation theories with its own characteristics. The neglect of traditional Chinese translation will inevitably lead to a sense of cultural inferiority among students. Translation has a long history in China. For example, *An Anthology of Chinese Discourse on Translation* edited by Martha P. Y. Cheung provides a systematic review of the ancient Chinese translation practice and the development of translation discourse. And a diversity of views, reflections and theoretical thinking

about the art and business of translating is brought together in this two-volume anthology. Down the centuries, translators, interpreters, Buddhist monks, Jesuit priests, Protestant missionaries, writers, historians, linguists, and even ministers and emperors have all written about translation and from an amazing array of perspectives. In introducing the history of translation and translation theories, teachers would be able to boost students' confidence in Chinese culture and get out of the "Western-centrism" in translation studies.

Under the background of exporting Chinese literature, translation plays the critical role of making the world understand the charm of Chinese literature and culture. In the selection of translation resources, good translation of Chinese literature could stimulate students to think about translation strategies and methods. Translation of Chinese literature by both sinologists and Chinese translators serves a good teaching resource. For example, Howard Goldblatt's numerous works of contemporary Chinese fiction are good examples for choice. Shen & Wei (2018: 17) pointed out that in the process of building a community with a shared future for mankind, China's translation strategy should focus on the planning of translating Chinese into other languages, disseminating "Chinese wisdom", "Chinese story" and "Chinese way" to the world. The choice of teaching resources should be helpful to promote students' confidence in Chinese culture and to improve the influence of Chinese culture in the world.

At the same time, the application of translation technology in the information age has overturned the traditional way of language service and played a great role in protecting the diversity of human languages. The change of translation working environment and translation tools require that translators should be familiar with computer-assisted translation and adapt to language service in the new age. However, the universality of translation technology has also brought ethical problems and moral dilemmas, such as loyalty, responsibility, fairness and justice in translation. Therefore, the class teaching could adopt simulated translation project to make student participate in the translation project. The students could play different roles such as project manager, translator, reviser and so on. This teaching design could make the students understand the workflow and requirements of the translation industry. Besides, the teachers should guide the students to build up the translator's professionalism in the process of completing the translation task.

3.2 Teaching Design

In the teaching design, IPE is integrated into teaching objectives, content, implementation and evaluation. The course focuses on cultivating students' translation skills as well as incorporating IPE into the subject content.

Traditional translation teaching focuses on students' acquisition of translation skills. The impart of translation skills is always the most important part in translation training. Most of the translation textbooks attach great importance in introducing the translation techniques such as addition, subtraction, division, combination, transformation and reorganization. The structure and content of those textbooks are based on the introduction of these techniques. And the translation methods are also generalized based on the comparison between the source language and the target language. However, if we follow the teaching mode of applying translation methods to practice in class, it will form a wrong understanding of the nature of translation among students, that is, only by mastering translation methods can they fulfill translation tasks. In fact, the most important thing in translation teaching is to cultivate the students' language competence in translation.

Therefore, on one hand, the course design follows a mode of translation skills acquisition that starts from translation examples reading to theoretical summary and then to translation practice guiding. Therefore, the course starts from "parallel text reading" to guide the student to study or practice translation. A parallel text is a text placed alongside its translation. To better use parallel texts in translation teaching, it is necessary to analyze and summarize the main features of the source and the target languages. In addition, the choice of parallel texts should integrate IPE. For example, *The Governance of China* depicts the practices of the CPC Central Committee, with Xi at the core, in uniting and leading Chinese people to uphold and develop socialism with Chinese characteristics in a new era and this book is also expected to help the international community better understand the path, concept and model of China's development. The English version of this compilation – titled in English *XiJinping: The Governance of China* , edited by the State Council

Information Office of China, the CCCPC Party Literature Research Office and China International Publishing Group is part of China's grand strategy to globally improve country's image abroad. And the book is explicitly targeted to “enhance the rest of the world’s understanding of the Chinese government’s philosophy and its domestic and foreign policies” and “to respond to rising international interest” (Xi, 2014: v). Translating political speeches is not a solitary undertaking, but a collaborative work practice that combines hard work of each translator. The book is rich in traditional Chinese poems and allusions. Huang (2018: 64), a member of the translation team, pointed out that to achieve a high-quality version, the translators should have "a linguistic awareness, the ability to understand both Chinese and English languages, a political awareness and target reader awareness ".

This is also what the course aims to achieve in the students. Translation examples are selected from the book according to the teaching objectives of each unit to raise the students’ awareness of the difference between Chinese and English languages.

ST: 这样一个大国，这样多的人民，这么复杂的国情，领导者要深入了解国情，了解人民所思所盼，要有“如履薄冰，如临深渊”的自觉，要有“治大国若烹小鲜”的态度（409-410）。

TT: In such a big, populous and complicated country as ours, we the leaders must have an in-depth knowledge of the national conditions, and learn what the people think and what they want. We must act self-consciously and with the utmost care “as if we were treading on thin ice, and standing on the edge of an abyss.” We must cultivate an attitude of “governing a big country is as delicate as frying a small fish”.（Vol. 1, p.458-459））

The source text is Present Xi’s speech " Governing a Big Country Is as Delicate as Frying a Small Fish". The allusion is from *Tao Te Ching*. When translating the allusions, we need to fully understand the allusions according to the context.

ST: 治国之要，首在用人。也就是古人说的：“尚贤者，政之本也。”“为政之要，莫先于用人。”(411)

TT: As our ancestors said, “Exaltation of the virtuous is fundamental to governance,” and “Employing capable officials represents the top priority of governance.”（461）

ST:创新是民族进步的灵魂，是一个国家兴旺发达的不竭源泉，也是中华民族最深沉的民族禀赋，正所谓"苟日新，日日新，又日新”。(51)

TT: Innovation is the soul driving a nation’s progress and an inexhaustible source of a country’s prosperity. It is also an essential part of the Chinese national character. This is what Confucius meant when he said, “If you can in one day renovate yourself, do so from day to day. Yea, let there be daily renovation.” (55-56)

IPE aims to use certain ideas, political views and moral norms to exert influence on students so that they form social practice activities that meet the requirement of the State. From the above examples, we can see that the source text contains many Chinese idioms, ancient sayings and allusions which convey the essence of Chinese culture. There is no corresponding expression in English, which requires translators to exert great creativity to properly present the connotation of Chinese language and culture to the target readers. This means that the translator should not translate the original allusions word for word but should use free translation or creative translation on the basis of a thorough understanding of the original text. In teaching, the course guides the student not to translate these allusions mechanically, but to combine the allusions with the context to achieve a thorough understanding. On the other hand, empowering students is an issue often discussed by translation scholars in relation with translation pedagogy. Tymoczko (2007:189) for example, considers empowerment of future translators as the key, which would enable them to “perceive the full range of possibilities of their profession”. The course designs a translation workshop according to the guiding principles of collaborative learning and scaffolding. And the translation workshop highlights building a collaborative learning environment for students, in which the teacher mainly acts as a facilitator, prepares students for lifelong learning by encouraging them to take the responsibility of their own learning. In Kiraly’s (2000:43) view, “in the case of translation, for example, the learning of professional translation skills would best be achieved through the collaborative undertaking of professional translation tasks, in all of their complexity, under the guidance of a professional translator”. The course considers translation as a social, dynamic and intersubjective process and seeks to empower students through learning and experience with real

life translation activities. In translation teaching, the teacher assigns the translation project to the students and they complete the translation tasks by discussing and working in groups. Students learn to identify potential translation problems, find resources to solve problems, and suggest solutions to these problems. This teaching style will encourage the students to identify the translation difficulties while in operation and adopt translation strategies appropriately to solve these problems.

IV. DISCUSSION AND CONCLUSION

This study provides a possible method for integrating IPE into translation teaching for English majors in China from the perspective of building a community with a shared future for mankind. Chinese universities pay high attention to IPE for students. IPE nowadays is delivered both through formal theoretical lectures as well as other specialized courses. And it has become one of the most important approaches for students to learn theories of society, politics and economics and understand the history of the country and the culture of the nation. This paper introduces the principles and the design of Chinese-English translation course combined with IPE in China. The course seeks an organic combination of IPE with translation teaching. And Practical hands-on experience has become an essential component of translation teaching in this course. In terms of translation materials, the course chooses political texts embedded with the spirit of Chinese culture and reflect national guidelines and policies, and in terms of teaching methods, the course follows the general development of students' translation abilities. The translation workshop designed according to the principles of social constructivist approach helped develop important qualities among students which can be effective after their graduation and in their profession. The study suggests that integrating IPE into translation teaching can help to promote a better understanding of the source culture, thus is helpful in achieving the goals of successful cultural identity formation and finally the cross-cultural communications.

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INFOGAIN PUBLICATION

International Journal of Advanced Engineering, Management and Science (IJAEMS)
Peer-Reviewed Journal
ISSN: 2454-1311 | Vol-8, Issue-5; May, 2022
Journal Home Page: https://ijaems.com/
Article DOI: https://dx.doi.org/10.22161/ijaems.85.6

Challenges encountered in the Implementation of Enterprise Resource Planning ERP in infrastructure contracting companies emphasis on business processes integration

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Received: 25 Apr 2022; Received in revised form: 18 May 2022; Accepted: 25 May 2022; Available online: 31 May 2022

Abstract**—** *The purpose of this paper is to present an integrative and detailed review of the critical factors of enterprise resource planning (ERP) that influence effectiveness of business process integration. Organizations' use of Enterprise Resource Planning (ERP) systems has changed the way they provide information systems. The research applied quantitative research method to examine the current study which analyzing the integrative and detailed review of the critical factors of enterprise resource planning (ERP) that influence effectiveness of business process integration. The researcher distributed 180 questionnaires among several projects in Qatar, however it was able to gather only 168 questionnaires out of 180 questionnaires. The findings revealed that all independent variables are positively and significantly influence dependent variable, moreover it was found the highest value was between PMIS and ERP integration, on the other hand the lowest value was for between control environment and ERP integration.*

Keywords**— Enterprise Resource Planning, business processes integration, Projects, Qatar.**

I. INTRODUCTION

A considerable of discussion has been generated over enterprise resource planning in the previous decade (ERP). In an ERP system, the numerous functional domains of an organization are integrated into one software solution, creating a link through the entire supply chain, which is aimed at providing the appropriate product at the right time, at the right place, and at the lowest cost (Hustad et al. 2020). Enterprise resource planning (ERP) is the foundation of many large organizations today across the world (Menon, 2019). Using these commercial software packages, companies may integrate all of their data, including financial and accounting data, human resources data, supply chain data, and consumer data, in a seamless manner (Ivanović & Marić, 2021). It is one of the most essential components of modern ERP systems that the integration that is implicit in the software design permits a significant level of integration between different business elements (Çınar & Ozorhon, 2018). So, ERP systems have become one of the most significant IT investments of the present day (Shukor et al. 2020). There are a wide range of functions that an ERP system may assist with, including production and logistics, financial management and accounting, sales and marketing as well as HR. An ERP system facilitates the exchange of data and knowledge, lowers operating expenses, and enhances the management of company processes. Many ERP systems, despite their advantages, fail (Khandaqji et al. 2022). Only a small amount of ERP implementation research has been done in the last few years, with the majority of studies focusing on specific organizations. Because so few implementation issues that led to these failures have been documented in the literature, practitioners and scholars are left in the dark when it comes to understanding why implementations fail. This is a reason to carry out empirical studies to investigate the difficulties of using ERP systems. ERP project implementation is

fraught with potential dangers that must be avoided if the project is to be a success. This research investigates the difficulties that user organizations in Qatar have had in implementing ERP systems. ERP system implementation issues were empirically determined through interviews with managers from five user organizations who were regarded as having a critical role in ERP system adoption (Ayani et al. 2021). According to Chauhan & Singh, (2020), quantifiable benefits of ERP include shorter lead times, 99 per cent on-time deliveries, increased business, an increase in inventory turnover of 30 per cent, a reduction in cycle time of 80 per cent, and a 70 per cent reduction in work-in-progress (WIP). Another set of potential advantages include a wealth of knowledge about client preferences, a significant savings in working capital, and an ability to view and control the entire extended enterprise of suppliers, partners, and customers as a single entity that can be managed (Rodríguez et al. 2020). For many firms, ERP systems have been installed to eliminate the patchwork of legacy systems and improve the communication and interactions with customers and suppliers (Taghipour et al. 2020). The advantages of a correctly designed ERP system include time and cost savings, faster transaction processing, improved operational performance, financial management, and customer service, web-based interfaces, and more effective communication (AboAbdo et al. 2019). ERP has gained a lot of interest from both practitioners in the business and academics in the field of ERP (Asif, 2018). "Complex technical, organizational, cultural, and political issues" have made ERP integration a "very challenging task" despite a decade's worth of advancements in ERP systems and ERP solutions (Dedan & Lyimo, 2019). An additional problem for organizations today is the dynamic and unpredictable nature of the business environment, as well as the growing number of customers with higher expectations (Chofreh et al. 2020). There are a number of reasons why ERP implementations fail, and they all have the potential to stifle the integration process. In spite of ERP systems' attempts to integrate all of a company's core processes, clients have noticed that certain essential functionality is missing. Hasheela-Mufeti, (2018) report this. Various business processes make up the network that is an ERP system, according to Katuu, (2021). Despite the widespread use of ERP software across a wide range of businesses, the difficulties encountered during and following deployment are a rising source of worry (Chofreh et al. 2018).

Conceptual Framework

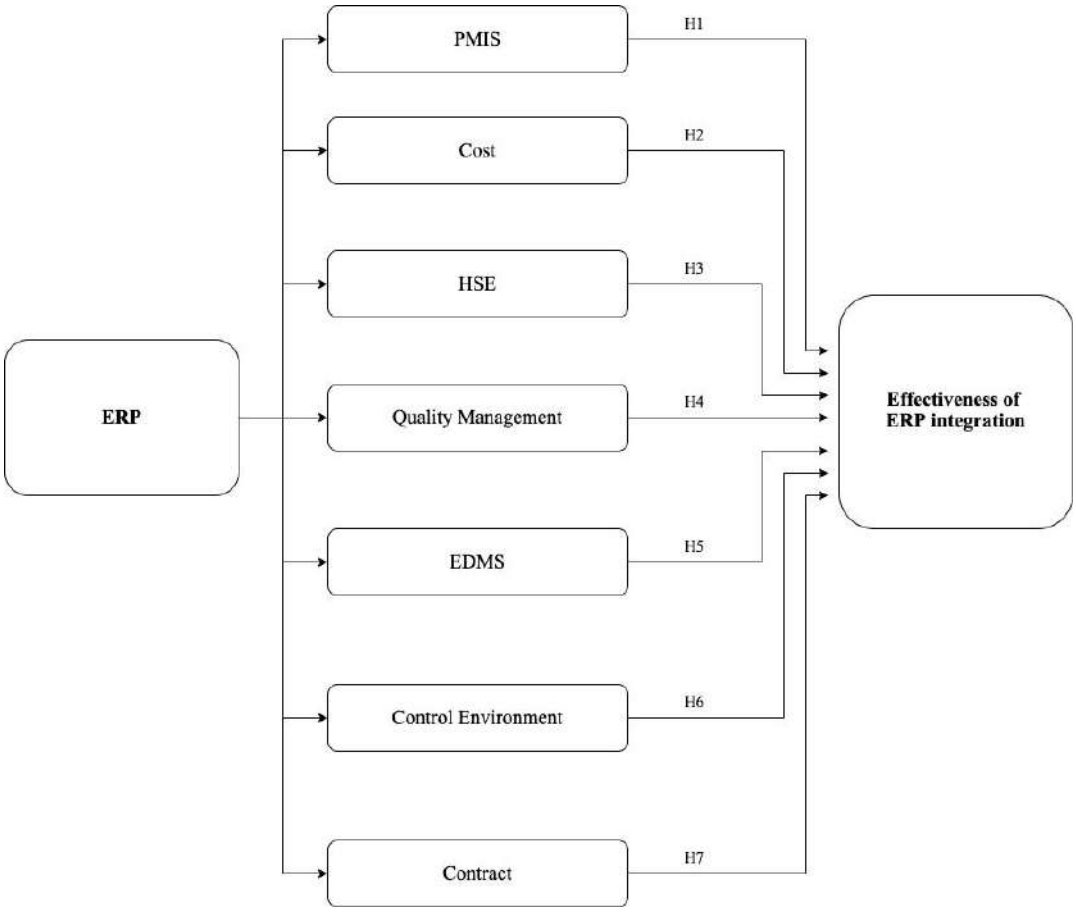

Figure 1: Conceptual Framework

Research Hypotheses

H1: Project management information system (PMIS) has positive and significant influence on effective ERP integration

H2: Cost has positive and significant influence on effective ERP integration

H3: Health, Safety and Environment (HSE) has positive and significant influence on effective ERP integration

H4: Quality Management has positive and significant influence on effective ERP integration

H5: Electronic Document Management System (EDMS) has positive and significant influence on effective ERP integration

H6: Control Environment has positive and significant influence on effective ERP integration

H7: Contract has positive and significant influence on effective ERP integration

II. LITERATURE REVIEW

Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) systems could well be characterized as the installation of standard software modules for fundamental company activities, often mixed with customised modification for competitive differentiation. A single pilot project or business function may serve as the starting point for this type of growth in many organizations. However, an ERP implementation's ability to expand to a company-wide and/or worldwide level remains a critical element (Herath & Wijenayake, 2019). This may be done via a Business Process Re-engineering (BPR) effort, which may be considered as the prologue to the execution of the project. Historically, organizations have preferred to acquire rather than construct their information systems by using commercially available off-the-shelf software since the 1960s. An ERP system, on the other hand, is more than just a collection of pre-written programs. It is a change management program that requires careful management of the human aspects involved with a review of business processes throughout the whole organization. ERP systems have witnessed a tremendous increase in use over the past decade, particularly among large corporations that are looking to implement a worldwide information systems strategy. A corporation, is the top ERP provider in the industry (You & Wu, 2019) offering enterprise integration of information systems and e-commerce operations. There is more to ERP initiatives than just establishing a computer system, according to Morrisson, (2020). Instead, corporations are reorganizing their businesses and going against the dominant corporate culture. ERP systems are rarely cited as a source of competitive advantage by Pakhale & Pal, (2020). In reality, prominent failures such as Dell Computers, Dow Chemicals, Fox-Meyer, and Mobil have been recorded (Neto & Neumann, 2020). Financial and human resources software, sales and order processing, material requirements planning (MRP) and MRP II were all launched in the 1970s as industry standards. They were designed primarily to serve business applications in an organization that was functionally driven. As a result, there was an increase in functional islands of information rather than a focus on process optimization. As a result, organizations were forced to function at sub-optimal levels in these information islands from a process standpoint. It was in Germany that initially an Integrations model (Dariea, 2021) and then, much later, Computer Integrated Manufacturing (CIM) were introduced in an attempt to prevent this sub-optimal scenario and to get closer to an overall ideal (Senaya et al. 2022). The processing of information was given a strong mechanistic bent in these advancements. It was Surung et al. (2020) that made the fundamental breakthrough in process-oriented thinking in IT. The outcome was the rising usage of integrated systems like SAP's R/3, which provided real-time support of whole business processes e.g., from the reception of a client order through the delivery of the completed items (Tavana et al. 2020). To simplify the process of standard software implementation, see it as a set of tasks that must be completed in order for a company to make efficient use of the program (Shkurti & Manoku, 2021). As a result, the software must be integrated into the company's operations and any resulting adjustments. A business process-oriented implementation is a step-by-step introduction of full business processes that are supported by the software, regardless of the functional structure of the organization and potentially even the program itself (Cadersaib et al. 2020). A business process focused approach is therefore a vital aspect of process-based information management and helps to optimize business processes independent of the software's design philosophy (Taghavi et al. 2019). ERP systems have now been adopted by the majority of Fortune 500 companies, and as the high end of the market gets saturated, ERP systems are flowing down to medium-sized organizations and to regions outside those originally penetrated in Europe and North America. While ERP systems are widely used in Europe and North America, they are significantly less common in underdeveloped nations. ERP suppliers, on the other hand, are increasingly targeting developing nations like Qatar because of their economic development (Kenge & Khan, 2020). Large and medium-sized businesses in Qatar and other developing nations are using ERP solutions and more are likely to do so. According to Shamshuddin &

Venkateswarulu, (2020), most adopting organizations have assumed that the so-called "best-of-suite solutions" that are included into these generic packages may be accessed with reasonable simplicity. However, the transfer of ERP systems to poor nations is generally hampered by issues of mismatch with local, cultural, economic and legal constraints, which are normally designed in rich countries. More recently, there's been little study done on ERP implementation: mostly individual case studies have been presented. Because so few implementation issues that led to these failures have been documented in the literature, practitioners and scholars are left in the dark when it comes to understanding why implementations fail. This is a reason to carry out empirical research to investigate the difficulties of using ERP systems. ERP project implementation is fraught with potential dangers that must be avoided if the project is to be a success. This research investigates the difficulties that user organizations in Qatar have had in deploying ERP systems. ERP system installation issues were experimentally determined through interviews with managers from five user organizations who were regarded as having a critical role in ERP system adoption (Ursacescu et al. 2019). According to Hewavitharana et al. (2019), quantifiable benefits of ERP include shorter lead times, 99 per cent on-time deliveries, increased business, an increase in inventory turnover of 30 per cent, a reduction in cycle time of 80 per cent, and a 70 per cent reduction in work-in-progress (WIP). Another set of possible advantages include a wealth of knowledge about client preferences, a significant savings in working capital, and an ability to see and control the entire extended business of suppliers, partners, and customers as a single entity that can be managed (Lubasi & Seymour, 2021). For many firms, ERP systems have been installed to eliminate the patchwork of legacy systems and enhance the communication and interactions with customers and suppliers (Jesus & Lima, 2021). The advantages of a correctly designed ERP system include time and cost savings, quicker transaction processing, improved operational performance, financial management, and customer service, web-based interfaces, and more efficient communication (Fiaz et al. 2018). ERP has gained a lot of interest from both practitioners in the business and academics in the field of ERP (Costin et al. 2020). Complex technical, organizational, cultural, and political issues have made ERP integration a "very challenging task" despite a decade's worth of advancements in ERP systems and ERP solutions (Chan & Chin, 2021). An additional problem for organizations today is the dynamic and unpredictable nature of the business environment, as well as the growing number of customers with higher expectations (Razmi et al., 2009). There are a number of reasons why ERP installations fail, and they all have the potential to stifle the integration process. In spite of ERP systems' attempts to integrate all of a company's core operations, clients have noticed that certain important functionality is missing. Alam & Uddin, (2019) describe this. Various business processes make up the network that is an ERP system, according to Hustad et al. (2020). Despite the widespread use of ERP software across a wide range of businesses, the difficulties encountered during and following deployment are a rising source of worry (Menon, 2019).

III. THE IMPLEMENTATION PROCESS

ERP implementations are frequently fraught with dread and anxiety, and this has been well-documented in the IT press. In any company, implementing a new business system is unquestionably a major undertaking. It should not come as a surprise given the magnitude of organizational change induced by the average deployment. Enterprise systems demand a high degree of organizational discipline in order to succeed. Consequently, a complete intervention will be difficult for businesses that are not used to this level of discipline. An R/3 deployment, for example, encourages a business to analyze all of its current processes and compare them to the "best practices" integrated in the package. Generally, the company must reengineer its processes to match R/3 in order to reconcile the disparities (Ivanović & Marić, 2021). Despite the fact that it is technically feasible to edit R/3 (make changes to the source code), few experts would recommend this technique. Nowadays, it is widely accepted that software should be implemented "as-is." Increased implementation costs and difficulties in adopting future software changes are a price to pay for "chocolate chips." Although the connection between the strategic and operational layers of the business process may appear insignificant, it is not. An incorrect company vision or aim might lead tactics to be called into question and even rejected. As a result, these techniques may and should be modified. It is possible to facilitate dialogue and an outlet for revising the vision by including strategic visioning into the implementation program. Decentralization of procurement procedures, for example, might be a strategic goal for one government agency (Çınar & Ozorhon, 2018). However, if the vision comes to fruition, the organization may have to make significant changes to its business operations and incur significant costs in the form of software licenses in order to do so. A cost-benefit analysis may show that the plan, while widely acknowledged as the "best" business practice, isn't really the "best practice" for the organization as a whole. Changing the strategic vision of decentralized procurement procedures can be made possible if strategic visioning is a component of the

implementation program. As a result, the company might avoid needless and expensive software license payments and align business operations with a more suitable vision, which may be better addressed with a more central procurement process. Many layered plans exist for various organizational units, and while the strategy goals at a higher level may be the same, each domain plan will most likely contain distinct objectives (Shukor et al. 2020). These many goals are frequently seen as conflicting ones in the real world, as seen by past experience. Because of this, it is necessary to document and analyze the connections between organizational goals and the operational architecture to uncover any potential inconsistencies. Establishing managerial accountability for previously agreed-upon or negotiated organizational agreements can be difficult without adequate evidence. Following this, we'll show you how 'linking' works and point you that, despite their importance, these linkages are generally not part of an ERP deployment program. However, our experience shows that if the ERP implementation program is not fully aligned with the company's long-term strategic goals, the deployment will be far less successful. Even if it isn't part of the implementation plan, strategic visioning may and should be utilized as a catalyst for alignment even if it isn't the primary motivator. With deregulation, privatization, and globalization, huge firms have been turned into giant multinational corporations because of these recent developments in the corporate environment (Khandaqji et al. 2022). It has become imperative for businesses to look for new strategies to survive and prosper in this shifting business climate. Companies may be able to adapt more effectively and efficiently to these developments thanks to IT. Although organizations must stay up with the latest technology in order to compete in today's highly automated and IT-driven corporate world (Ayani et al. 2021). Examples of these technologies include enterprise resource planning systems (ERPs) (Chauhan & Singh, 2020). An ERP system is a general word for a computer network that serves a whole company. Accounting, stock control and logistics are among the operations that may be carried out by the modules in this system (Rodríguez et al. 2020). Automating corporate operations, sharing common data, and producing real-time data are all essential components of an ERP system. It appears that traditional information systems (IS) do not meet the needs of today's business leaders in terms of transaction processing, reporting, and information for decision making in a modern corporate environment that emphasizes operational automation, effectiveness, and efficiency. By providing fast and accurate information, ERP systems may help firms make better decisions by allowing them to get the information they need. In addition, ERP software may help with better operations planning and management. Because of this, operations become more efficient and effective, which in turn improves customer satisfaction (Taghipour et al. 2020). A questionnaire will be used to gather data on the impact of ERP systems on businesses that use them, with a focus on the accounting functions that they support. To find out how ERP systems have contributed to these alterations in accounting processes, this research aims to find out how much support they have provided. When it comes to ERP systems, advanced manufacturing technologies (AMT) were designed to improve quality by reducing inventory and enhancing customer service (AboAbdo et al. 2019) Furthermore, MRPII looks to be an essential feature of an ERP system that is considered "complete" (Asif, 2018). ERP systems are also being implemented because of the year 2000 issue, currency consolidation (Euro), integration of all corporate operations and procedures, and an Internet interface (Dedan & Lyimo, 2019). ERP systems regard transactions as one of the interconnected operations that make up the whole enterprise (Chofreh et al. 2020). Automating and integrating corporate processes, sharing data across departments, and producing and accessing information in a real-time environment are just some of the benefits of these systems (Hasheela-Mufeti, 2018). If a customer order is entered into the system, for example, the system's stock levels, general ledger, and logistics will be updated. An ERP system that is "complete" includes not just the typical accounting information system, but also inventory control, manufacturing resource planning (MRP), and logistics. EDI systems and e-commerce may also be part of an ERP system (Katuu, 2021). This all-inclusive IS capable of generating tremendous benefits to organizations via increased effectiveness and efficiency in operations, business processes and strategic decision making (Chofreh et al. 2018). These include operational, managerial, strategic, IT infrastructure, and organizational components, which are all intertwined in a corporate enterprise's operations and management. There have also been discussions on ERP systems' usefulness (Scott and Kaindl, 2000) and their flexibility (Herath & Wijenayake, 2019). To address both inflexibility and functionality issues, the "best of breed" approach has also been pushed forward as a solution (You & Wu, 2019). The integration of ERP systems with existing systems is another significant issue (Morrisson, 2020). The interdependencies that are at the heart of this system's strength can also be its greatest weakness, resulting in data mistakes and service disruptions (Pakhale & Pal, 2020). It appears that significant cost and schedule overruns are a significant impediment to their success, as are issues with the organization, such as employee opposition (Neto & Neumann, 2020). Despite this, ERP systems aren't a one-size-fits-all solution for

"false" underlying corporate structures and processes. ERP system implementations often hinge on a variety of variables, including organizational culture, top-level management support, open lines of communication, and the suitability of existing business and IT systems (Dariea, 2021). Accounts Receivable and Payable, Fixed Assets, Cash Management, Cost Control and Budgeting are all part of the accounting module of an ERP system. ERP systems, on the other hand, give firms the potential to optimize business operations by integrating all of an organization's functional areas. Financial and non-financial data can be merged into a single system. Only one Australian study has examined this topic to yet, according to the authors' research (Senaya et al. 2022). ERP systems have been shown to be successful in transaction processing, but less so in reporting and decision support. It's been suggested that ERP systems make it easier to use cutting-edge accounting techniques like activity-based budgeting (ABB), product lifecycle costing (PLC), and balanced scorecards. There are several advantages to using ERP systems in accounting, which is why we conducted this investigation. Because of this, despite their enticing nature, enterprise resource planning (ERP) systems suffer from several drawbacks. Examining how ERP systems affect the accounting operations of organizations, this research explores the viewpoints of managers of companies that have implemented ERP systems. ERP systems' motivations and benefits are also examined. It is the goal of this article to throw more light on the advantages of ERP systems over the old Information System (Surung et al. 2020).

IV. RESEARCH METHODOLOGY

Research Method

This research applied quantitative research and executing description approach with open ended questions in order to confirm that every circumstance provided complete evidence of their knowledge. In this research, the questionnaires are distributed their knowledge in their empirical learning procedure. This examination will give rich portrayals of cycles and miniature level, and encourage designs for additional exploration. This examination will empower to develop involvement with miniature level and comprehend the function of experiential learning on the enterprising goal. There are three transcendent exploration draws near: subjective, quantitative and blended strategies. Tavana et al. (2020) guarantee that early business research was prevalently supported by quantitative examination. Such a quantitative establishment has limited business research. Regardless of quantitative research producing critical information amassing, business analysts have commonly fizzled in building up a hypothesis. Thusly, this study applied quantitative research method to examine the integrative and detailed review of the critical factors of enterprise resource planning (ERP) that influence effectiveness of business process integration.

Research Design

This section offers the aspects of the research design to attain data applicable to concentrating successfully the questions of the research. As mentioned earlier in the previous section, the research applied quantitative research method to examine the current study which analyzing the integrative and detailed review of the critical factors of enterprise resource planning (ERP) that influence effectiveness of business process integration. The researcher developed seven research hypotheses to measure the examine the integrative and detailed review of the critical factors of enterprise resource planning (ERP) that influence effectiveness of business process integration in Qatar, by developing an academic questionnaire which was adapted from different academic sources and then to be distributed among employees at selected projects in Qatar.

Data Collection

Deciding concerning the study sample is important since selecting an accurate sample effect in gathering suitable data that aids with examine the study successfully. Because of the circumstance that there would be a resilient relationship between the purpose of the study and study design (Shkurti & Manoku, 2021), and additional, selecting the study members requests to be well-matched with the study concentration. Consequently, selecting these members is probable to not be an easy job till the study concentration is well-defined (Cadersaib et al. 2020). The chief dependence of quantitative studies for gathering data is on probability sampling. By depending on such, academics practice their personal decisions to select the study sample and population, therefore, entirely of the study population will get the equivalent chance to be selected (Kenge & Khan, 2020). Therefore, quantitative studies, inconsistently does not typically employment sampling approaches that pursue to create statistical representativeness. In this respect, Lubasi & Seymour, (2021) claims that one of the central thoughts once choosing the sample for quantitative studies is that the persons designated can great aid with discovering an essential occurrence detailed, consequently, quantitative studies purposely choice the sample for their study. Such a sample includes of a number of approaches obtainable for scholars to select from. The choice overdue choosing the sample of the current research has been completed on two stages: universities assortment and people assortment. With respect to universities assortment, the two principles recognized by Fiaz et al. (2018) have been applied to create this collection.

Primary, the examiner requests to have sufficient admission to the data essential for directing her study. Second, the chosen circumstances should be one of the greatest possible situations that can successfully measure developed research hypotheses. Several projects in Qatar were chosen to be the chief foundation for obtaining data. Nowadays, it is significant to recognize that obtaining enough admission to the places and people is one of the important measures applied to choose the quantitative study sample (Jesus & Lima, 2021). Notwithstanding this, academics preferably purpose at gathering data from a collection of contributors in a specific public/group or cluster of societies. Their capabilities to attain such a goal are related with, initially, retrieving those societies/societies and target participants, and secondly, gaining permission for collecting the required data (Costin et al. 2020). It is value stating that the additional two foundations of indication of the current thesis are available from all selected projects that signify the study population. As for specific collection, the managers of projects and employees are selected to be segment of the current study. Further, to the convenience debated earlier, there are two additional details for selecting these management levels to handle and manage research questionnaire.

Participants and Sample Size

The contributors of the thesis are from four different projects in Qatar. They are eagerly chosen to take part and the aim to choose them is that they signify the greatest effective language workers in the learning setting of the thesis. The researcher distributed 180 questionnaires among several projects in Qatar, however it was able to gather only 168 questionnaires out of 180 questionnaires.

Instruments

The study used a survey of reliable resources published in high international journals. The study on the Likert scale examined all survey questions. The scales ranged from 1, which means completely disagree to 5, which means strongly agree. However, the questionnaire was adapted from (Gattiker, 2007; Ha et al. 2014; Spathis & Constantinides, 2004).

Data Analysis

Table 1: Reliability Analysis

No	Variables	Number of questions	Cronbach Alpha
1	PMIS	7	.749
2	Cost	8	.755
3	HSE	5	.729
4	Quality Management	7	.761
5	EDMS	6	.772
6	Control Environment	5	.769
7	Contract	5	.791
8	ERP integration	7	.786

The study applied reliability analysis to measure the reliability for each variables used to examine the integrative and detailed review of the critical factors of enterprise resource planning (ERP) that influence effectiveness of business process integration. The results of reliability analysis showed that the Cronbach alpha for PMIS was .749 for seven questions, this indicated that all seven questions used to measure PMIS were reliability for the current study. The Cronbach alpha for cost was .755 for eight questions, this indicated that all eight questions used to measure cost were reliability for the current study. The Cronbach alpha for HSE was .729 for five questions, this indicated that all five questions used to measure HSE were reliability for the current study. The Cronbach alpha for quality management was .761 for seven questions, this indicated that all seven questions used to measure quality management were reliability for the current study. The Cronbach alpha for EDMS was .772 for six questions, this indicated that all six questions used to measure EDMS were reliability for the current study. The Cronbach alpha for control environment was .769 for five questions, this indicated that all five questions used to measure control environment were reliability for the current study. The Cronbach alpha for contract was .791 for five questions, this indicated that all five questions used to measure contract were reliability for the current study, and the Cronbach alpha for ERP integration was .786 for seven questions, this indicated that all seven questions used to measure ERP integration were reliability for the current study.

Table 2: Correlation Analysis

Correlations		
		ERP Integration
PMIS	Pearson Correlation	.701**
	Sig. (2-tailed)	.000
	N	168
Cost	Pearson Correlation	.612**
	Sig. (2-tailed)	.000
	N	168
HSE	Pearson Correlation	.639**
	Sig. (2-tailed)	.000
	N	168
Quality Management	Pearson Correlation	.691**
	Sig. (2-tailed)	.000
	N	168
EDMS	Pearson Correlation	.598**
	Sig. (2-tailed)	.000
	N	168
Control Environment	Pearson Correlation	.624**
	Sig. (2-tailed)	.000
	N	168
Contract	Pearson Correlation	.501**
	Sig. (2-tailed)	.000
	N	168
** Correlation is significant at the 0.01 level (2-tailed).		

The study applied correlation analysis to measure the correlation between each independent variable and dependent variable. The correlation analysis results showed that the Pearson correlation between PMIS and ERP Integration was .701**, this indicated that there is a positive and strong correlation between PMIS and ERP Integration. The Pearson correlation between cost and ERP Integration was .612**, this indicated that there is a positive and moderate correlation between cost and ERP Integration. The Pearson correlation between HSE and ERP Integration was .639**, this indicated that there is a positive and moderate correlation between HSE and ERP Integration. The Pearson correlation between quality management and ERP Integration was .691**, this indicated that there is a positive and strong correlation between quality management and ERP Integration. The Pearson correlation between EDMS and ERP Integration was .598**, this indicated that there is a positive and moderate correlation between EDMS and ERP Integration. The Pearson correlation between control environment and ERP Integration was .624**, this indicated that there is a positive and moderate correlation between control environment and ERP Integration, and the Pearson correlation between contract and ERP Integration was .501**, this indicated that there is a positive and moderate correlation between contract and ERP Integration.

Multiple Regression Analysis

Table 3: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.631a	.641	.674	.26458
a. Predictors: (Constant), ERP Integration				

Table (3) demonstrates the value of R, the value of R Square and the value of Adjusted R Square, the findings showed that the value of R is .631 and the value of R Square is .641 and the value of Adjusted R Square is .674, these referred that there is a strong connection between (PMIS, Cost, HSE, Quality Management, EDMS, Control Environment, Contract) as independent variables with ERP Integration as dependent variable.

Table 4: ANOVA

ANOVA						
Mode		Sum of Square	df	Mean Square	F	Sig.
1	Regression	31.015	1	36.524	456.123	.000b
	Residual	20.651	358	.071		
	Total	71.256	342			
a. Dependent Variable: ERP Integration						
b. Predictors (Constant), PMIS, Cost, HSE, Quality Management, EDMS, Control Environment, Contract						

Table (4) demonstrates ANOVA between (PMIS, Cost, HSE, Quality Management, EDMS, Control Environment, Contract) as independent variables and ERP Integration as dependent variable. It can be seen that the value of Sum of Squares, the value of Mean square, the value of F and Significant value. The findings showed that the value of Sum of Squares is 31.015 at the regression level and 20.651 at residual level as total is 71.256, the value of Mean square is 36.524 at regression level and .074 at residual level, the value of F is 456.123 and Significant value is .000, all these referred that there is a strong connection between (PMIS, Cost, HSE, Quality Management, EDMS, Control Environment, Contract) as independent variables and ERP Integration as dependent variable.

Table 5: Multiple Regression

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. error	Beta		
1	(constant)	.081	.123		.547	.493
	PMIS	.711	.019	.732	2.352	.000
	Cost	.592	.021	.601	2.239	.000
	HSE	.612	.032	.619	1.872	.000
	Quality Management	.623	.015	.628	1.792	.000
	EDMS	.683	.025	.689	1.342	.000
	Control Environment	.529	.011	.536	2.877	.000
	Contract	.536	.029	.541	2.335	.000
a. Dependent Variable: ERP Integration						

The study applied multiple regression analysis to measure developed research hypotheses. The findings showed that the B value was .711, Beta value was .732 respectively between PMIS and ERP integration, this showed a positive and significant relationship between PMIS and ERP integration; accordingly, the first research hypothesis is supported which stated that '' Project management information system (PMIS) has positive and significant influence on effective ERP integration ''. The B value was .592, Beta value was .601 respectively between cost and ERP integration, this showed a positive and significant relationship between cost and ERP integration; accordingly, the second research hypothesis is supported which stated that '' cost has positive and significant influence on effective ERP integration ''. The B value was .612, Beta value was .619 respectively between HSE and ERP integration, this showed a positive and significant relationship between HSE and ERP integration; accordingly, the third research hypothesis is supported which stated that '' HSE has positive and significant influence on effective ERP integration ''. The B value was .623, Beta value was .628 respectively between quality management and ERP integration, this showed a positive and significant relationship between quality management and ERP integration; accordingly, the fourth research hypothesis is supported which stated that '' Quality management has positive and significant influence on effective ERP integration ''. The B value was .683, Beta value was .689 respectively between EDMS and ERP integration, this showed a positive and significant relationship between EDMS and ERP integration; accordingly, the fifth research hypothesis is supported which stated that '' EDMS has positive and significant influence on effective ERP integration ''. The B value was .529, Beta value was .536 respectively between control environment and ERP integration, this showed a positive and significant relationship between control environment and ERP integration; accordingly, the sixth research hypothesis is supported which stated that '' Control environment has positive and significant influence on effective ERP integration ''. The B value was .536, Beta value was .541 respectively between contract and ERP integration, this showed a positive and significant relationship between contract and ERP integration; accordingly, the seventh research hypothesis is supported which stated that '' Contract has positive and significant influence on effective ERP integration ''. The findings revealed that all independent variables are positively and significantly influence dependent variable, moreover it was found the highest value was between PMIS and ERP integration, on the other hand the lowest value was for between control environment and ERP integration.

V. CONCLUSION

The influence of ERP systems on Qatar's accounting procedures was examined in this study for the first time. According to the results of the poll, organizations are using ERP systems to stay competitive and flourish in today's market. ERP users are driven primarily by the need for application integration, real-time data, and, in particular, data for decision-making. This shows that ERP systems are becoming a need for organizations to remain competitive in this new business climate rather than a new strategic decision, as some had previously thought. ERP systems, on the other hand, provide firms with the ability to re-engineer their operations and update their IT systems as well as their business procedures. The findings revealed that all independent variables are positively and significantly influence dependent variable, moreover it was found the highest value was between PMIS and ERP integration, on the other hand the lowest value was for between control environment and ERP integration. ERP systems have brought about a lot of modifications in accounting practices, according to empirical research. Non-financial performance indicators, segmental/product profitability analyses, and the installation of an internal audit role are among the most commonly cited examples. It's worth noting, however, that these alterations are the result of ERP systems' primary advantages, which have also been the driving factor for managers' adoption of them.. This is further supported by the most highly ranked perceived advantages of ERP system adoption, as reported by respondents. Accounting software can be integrated, information can be generated more quickly, and the quality of financial reports and choices may be enhanced with fast and accurate accounting information. The fact that ERP systems are still in their infancy has also been cited as a reason for the lack of widespread adoption of ERP improvements and the potential advantages of doing so. ERP systems have yet to make a significant influence on accounting processes because these firms have just recently implemented them. In addition, ERP systems' complexity necessitates some time before users can enjoy the full benefits. As a general rule, long-term advantages come from ERP installation (Poston and Grabski, 2001). The improvements and advantages that come with them, however, do not represent true innovation, but rather just keeping up with the rapid pace of change in the commercial world. ERP systems have become a need for firms in this increasingly competitive, highly automated, and IT-driven corporate world. Further study may explore the influence of both technical and "softer" variables in bringing about drastic changes in accounting processes. to procedures. Employee resistance to change might be a factor in the latter. ERP solutions necessitate not just a restructuring of company processes and structures but also, and perhaps

most crucially, a shift in management philosophy and culture (Wood and Caldas, 2001). Hence, senior management backing, internal and external cooperation, as well as training and engagement by employees, appear to be key factors in successful ERP systems. In addition, in today's IT-driven workplace, accountants must have strong IT abilities in order to put their training to good use. Examining their ability to adapt to this new, more demanding duty might also help explain these results. ERP systems are a good choice for businesses looking for a comprehensive set of capabilities throughout their whole organization, as well as the advantages of integration and best practices in their information systems. As a result, there has been an increase in the number of businesses utilizing ERP. It has been stated that ERP implementations are often unsuccessful. More than a dozen studies have examined ERP installations, and the findings have led to the conclusion that only around ten percent of them succeed. In this research, a comprehensive literature review was used to identify a variety of crucial failure variables. These studies, while providing valuable insight into ERP deployments' successes and failures, were lacking in certain cases.

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Appendix - Survey

Background information

- **Gender:**

☐ Male

☐ Female

- **Age**

☐ 18-20

☐ 20-25

☐ 26-30

☐ 31-35

☐ 36 -40

☐ 41-45

☐ 46 and over

- **Marital Status**

☐ Single

☐ Married

- **Level of education**

☐ High School

☐ Diploma

☐ Bachelor

☐ Master

☐ PhD

Below questions describe the Challenges encountered in the Implementation of Enterprise Resource Planning ERP in infrastructure contracting companies emphasis on business processes integration. Please tick (√) one cell for each statement that most closely describes your overall opinion of each item.

1= Strongly disagree, 2=Disagree, 3= Neutral, 4=Agree, 5= Strongly agree

Project management information system (PMIS)						
No	Questions	1	2	3	4	5
1	Information provided by company is critical to the performance of the business processes integration					
2	Increased flexibility in information generation is significant to the performance of the business processes integration					
3	Improved decisions based on timely and reliable information is important during the implementation of Enterprise resource planning					
4	Improved decision-making process in project information system					
5	Reduction of time for transaction processing during the project					
6	It is important to reduce of personnel of information system department during the implementation of Enterprise resource planning					
7	Increased integration of information applications is significant during the implementation of Enterprise resource planning					
Cost						
No	Questions	1	2	3	4	5
1	Reduction of time for closure of annual accounts is essential during the implementation of Enterprise resource planning					
2	It is important to increase use of financial ratio analysis during the implementation of Enterprise resource planning					
3	Planning to reduce time for issuing of reports – statement of accounts during the implementation of Enterprise resource planning					
4	Planning to improve internal audit function during the implementation of Enterprise resource planning					

5	Company should reduce time for closure of monthly accounts during the implementation of Enterprise resource planning					
6	Reduction of time for closure of quarterly accounts is significant during the implementation of Enterprise resource planning					
7	Improved working capital control is critical during the implementation of Enterprise resource planning					
8	Reduction of time for issuing payroll is vital during the implementation of Enterprise resource planning					
Quality Management						
No	Questions	1	2	3	4	5
1	Continuous investment of significant time and resources in training employees in the post-implementation stage					
2	Continuous and adequate on-the-job training to internal user groups in the post-implementation stage					
3	Continuous provision of both technology and process training to employees in the post-implementation stage					
4	ERP helps this project adjust to changing conditions within the implementation of Enterprise resource planning					
5	ERP has improved this project's coordination with the implementation of Enterprise resource planning					
6	ERP makes this project aware of important information from the implementation of Enterprise resource planning					
7	ERP helps this project synchronize with the implementation of Enterprise resource planning					
Health, Safety and Environment (HSE)						
No	Questions	1	2	3	4	5
1	Using HSE measurement items for Implementation Success					
2	Business processes should control HSE to ensure correctness in the post-implementation stage					
3	Business processes should check continuously to prevent defects in HSE in the post-implementation stage					
4	Business processes should evaluate continually for improvement of HSE in the post-implementation stage					
5	Process improvement standards of HSE are raised continuously in the post-implementation stage					
Electronic Document Management System (EDMS)						
No	Questions	1	2	3	4	5
1	Regular consultation between EDMS and business managers for business and technical decisions in the post-implementation stage					
2	Sharing ideas, information, and resources between the departments using ERP in the post-implementation stage					
3	Development of mutual understanding of responsibilities of EDMS in ERP in the post-implementation stage					
4	Making joint decisions about EDMS to improve overall operation efficiency in the post-implementation stage					
5	Shared vision for how EDMS will support the business in the post- implementation stage					
6	Overlapping frequent use of formal and informal channels of communication between EDMS and business departments in the post- implementation stage					

Control Environment						
No	Questions	1	2	3	4	5
1	To be successful, this project must be in constant contact and control environment during the implementation of Enterprise resource planning					
2	Frequent information exchanges with internal and external business environment are essential during the implementation of Enterprise resource planning					
3	The actions or decisions of environmental control have important implications for the operations during the implementation of Enterprise resource planning Improved quality of reports – statement of accounts					
4	Close coordination with environment control is essential during the implementation of Enterprise resource planning					
5	Qualification of personnel in charge of ERP during the implementation of Enterprise resource planning					
Contract						
No	Questions	1	2	3	4	5
1	This project works independently and has legal background					
2	If this project's legal links and communications are significant during the implementation of Enterprise resource planning					
3	The degree to which legal problems regarding ERP are solved whenever they occur during the implementation of Enterprise resource planning					
4	Whether enough legal personnel with functional knowledge are included in the team during the implementation of Enterprise resource planning					
5	The permanence of the ERP legal team during the implementation of Enterprise resource planning					
Enterprise Resource Planning ERP						
No	Questions	1	2	3	4	5
1	In terms of its business impacts on the project, the ERP system has been a success during the implementation of Enterprise resource planning					
2	ERP has seriously improved this project's overall business performance during the implementation of Enterprise resource planning					
3	From the perspective of this project, the costs of ERP outweigh the benefits during the implementation of Enterprise resource planning					
4	ERP has had a significant positive effect during the implementation of Enterprise resource planning					
5	Demonstration of continuous enthusiasm and interest in the post- implementation stage					
6	The overall level of management support in the post- implementation stage					
7	Personal involvement of upper-level managers in ERP in the post- implementation stage					