The Use of Virtual Reality for the Real Estate and Hospitality Industries

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Proposal Submitted to Entrepreneurship Research Award 2022

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Objective of this Research

The purpose of this proposal is to build a virtual reality marketing and training system (VRMTS) for the real estate and hospitality industries. The secondary purpose of this proposal is to study the impact of VR on real estate and hospitality industries. This proposal has three objectives. First, a VR headset will be used by students/customers to view the video created by 360-degree camera. Second, a sample of an interactive VR gaming system with AI capabilities for real estate and hospitality industries will be developed. Third, the performance of the VRMTS for real estate will be investigated to review the potential of virtual reality in other entrepreneurship practices.

Abstract of the Proposed Paper

The purpose of this paper is to study the impact of a virtual reality systems on the real estate and hospitality industries. Frist, this paper first describes how to develop a virtual realty marketing and training system. Second the performance of a VR system for real estate and hospitality will be investigated to review the potential of expanded use of virtual reality for various businesses. The three hypotheses were derived and tested. The experiments were administered by the principal investigator to a group of customers from a motel and CIS students (served as end users) in a university. Questionnaires were devised to determine, from the end users' perspective, the success of the VR systems.

Significance of the Proposed Study

For the entrepreneurs and small businesses, technology is one way for gaining competitive advantages. Virtual realty is one of these technologies. What is virtual

reality? It is a "simulated experience that can be similar to or completely different from the real world." A customer can wear a headset and feels that he is in a real environment. It allows customer to narrow down the right real estate properties he wanted. In addition, a gaming-like feature can be added to the virtual reality so that he can interact with the simulated system to know what he expects. Combined with AI, VR will have a significant value not only to marketing but also to employee training.

Contribution to the Literature/Its Contribution to Entrepreneurship Practices

There is moderate discussion of virtual reality in literature but the VR applications in marketing in real estate or hospitality industries are rare. There are a lot of discussion of virtual reality in teaching/training but there are only a few related to employee training in real estate and hostility industries. In addition, the combination of AI and VR for data analytics is an emerging area for entrepreneurship practices.

Timeline of the Proposed Methodology and Timeline for Completion

Time	Research Stages	Description and Student Participation
11/2022 to 1/2023	Instrument Development	- IS students will assist PI in developing the VRMTS model and questionnaire design **- Apply Human Subject Approval if necessary. Purchase of equipment**
2/2023 to 4/2023	Data Collection	- A sample of at least sixty business student/customers will serve as subjects. Dr. Kuo Lane Chen, the CEO of Arlington Inn and Suites, agreed to conduct the experiment.
5/2023 to 7/2023	Data Analysis	- Quantify response from students/customers - Assist in interpretation of data (t-tests)
8/2023 – 9/2023	Presentation of the Results	- Assist in submission to professional conference/journals

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EDUCATION

9/84-5/91	**Ph.D. in Business Administration,** **Georgia State University, Atlanta, Georgia 30303**
1/01-8/03	Master of Science in **Management Information Systems,** University of Houston, Clear Lake, Texas
6/04-8/04	Graduate Certificate in **Information Assurance**, Purdue University, West Lafayette, Indiana Graduate Computer Science/Technology Courses in the School of Technology: *Network Security, Information Security, and Digital Forensics.*
10/74-6/78	BA in Law Fu-Jen Catholic University, Taipei, Taiwan

<u>COMPETITIVE AWARD AND HONOR</u>

"Using Microsoft Dynamics CRM and GP for Information Systems Audit: A Curriculum Package for Information Systems Audit or Security Courses," (with K. Chen and C. Lee) Received the **Microsoft Dynamics Instructional Award at** the Microsoft Academic Conference held in Microsoft Headquarters, Redmond, WA, June 2017.

"Implementation of a Tutorial System for Social Media Analysis in a Cloud Computing Environment," received the **eFellows Award** ($2,000) at EMU, November 2017.

"Using Microsoft Dynamics CRM for Business Process Management:
a Curriculum Package for Business Process Management or Supply Chain Management Courses", **Microsoft Dynamics Instructional Award**, the annual conference of Worldwide Microsoft Dynamics Academic Preconference in New Orleans, 2013**.**

Outstanding Teaching Award, College of Business, Eastern Michigan University, 2011, 2014, 2018 (Only one faculty can receive this award each year).

"**Customer Order Acceptance Decision Models for a Process-Focused Production System,**" received the **Distinguished Paper Award**, the 1999 National Conference of Academy of Information and Management Sciences, Myrtle Beach, South Carolina, April 1999.

"A Test-Based Distributed Multimedia Tutoring System for the Production and Operations Management Course in the College of Business," **Honorable Mention (Also received $250)**, **the Instructional Innovation Award** competition for the 1996 Decision Sciences Institute annual meeting, Orlando, Florida.

Received the **Regents' Merit Award**, Lamar University - Beaumont, 1995.

Huei Lee and Donald L. Jordan, "An Investigation of the Impact of Using Multimedia in a Production/Operations Management Course in the College of Business," won the **Research Award** of the Southern Business Administration Association, 1993. (Also received $3,000)

Passed the Public Officers' Exam (also known as "高考" in Chinese) in Financial Law Personnel, Taiwan, ROC (1980).

SHORT TERM TRAINING OR CERTIFICATES

• **Microsoft Dynamics AX** Workshop, Microsoft, 2013, 2014
• SAP Educational Services: **SAP** Training Workshop, Sam Houston State University, Huntsville, Texas, 2010, 2011, 2013, 2014, 2019, 2020.
• SAP Educational Services: SAP Business Process Workshop, Winsor, Canada, 2008.
• **Microsoft Dynamics GP** Workshop, Western Michigan University, 2006
• **Cisco Security** Certificate, University of Maryland University College, 2005
• SAP Educational Services America's Certificate: SAP Business Process Workshop, Ypsilanti, August 10-16, 2003.
• SAP Educational Services America's Certificate: SAP101 Overview Workshop, Boston, August 5-8, 2002.

WORKING AND TEACHING EXPERIENCE

8/2009-Now
Professor of Computer Information Systems,
Eastern Michigan University, Ypsilanti, MI 48197

Taught:
IS 247 Introduction to Web Application Development, IS 320 Business Data Communications and Computer Networks, IS 413 Information Technology Infrastructure and Security, IS 416 System Software Administration, IS 421 Advanced Database Design, IS 605 Managing Information Technology, IS 620 Data Communications and Networks, IS 624 Web Servers and Systems Software, IS 427/627 Business Process and Identity Management, IS 437/637 Information Systems Audit, IS 660 E-Business Applications Development, SCM 420 Operating Planning and

Scheduling in Supply Chain, SCM 614 Information Technology for Supply Chain Management, IA 480 SQL and Database Security, IS 215 End-User Computing, DS 265 Business Statistics.

Handling Microsoft Dynamics Student Certificate for Microsoft.

8/2012-5/2013   CIS Program Student Advisor &
Professor of CIS and Supply Chain Management,
Eastern Michigan University, Ypsilanti, MI 48197

8/2004-7/2008   Associate Professor/Professor of Computer Information Systems &
Supply Chain Management, Eastern Michigan University, Ypsilanti, MI 48197

8/2001-7/2004   Assistant Professor of Computer Information Systems
Department of Computer Information Systems
Eastern Michigan University, Ypsilanti, MI 48197
Taught **1. Undergraduate**: IT infrastructure & Security, Data Communications, End-User Computing, Business Statistics
2. Graduate: Data Communications and Networking, IT for Supply Chain Management, E-Business Applications Development, Information Systems Audit, Business Process and Identity Management.

9/91-6/01   Associate/Assistant Professor of Management (Tenure)
Department of Management and Marketing
Lamar University, Beaumont, Texas 77710
Taught **1. Undergraduate**: Production Management, Quality and Productivity Management, and Systems Analysis and Design
2. Graduate: Business Research and Operations Management and Information Systems

PUBLICATIONS AND CURRENT RESEARCH

1. Refereed Journals:

Haddud, A., DeSouza, A., Khare, A. & Lee, H. (2017). "**Examining potential benefits and challenges associated with the Internet of Things integration in supply chains**," *Journal of Manufacturing Technology Management*, Vol. 28 Issue 8, 2017, pp. 1055-1085. This paper has been selected by the editorial team as Highly Commended in the **2018 Emerald Literati Awards**.

Haddud, A., Dugger, J. & Lee, H. (2015). **Manufacturing Control, Asset Tracking and Asset Maintenance: Assessing the Impact of RFID Technology Adoption**. *Journal of International Technology and Information Management, 2015*.

Lee, H., Zhang, Y., & Chen, K. (2013**). An Investigation of Features and Security in Mobile Banking Strategy**. *Journal of International Technology and Information Management,* 22(4)*,* 2013, 23-45.

Haddud, A. & Lee, H. (2013). **Use of RFID Technology in Lean Manufacturing: A**

Survey on Inventory Management. *International Journal of Management Theory and Practices,* 14(1).

Zhang, Y., Chen, K., Lee, H., & Yang, Y. (2012). **Adoption of Online Service and Security Features by Financial Intermediaries**. *International Journal of Electronic Finance,* 6(3/4), 219-238.

Kao, F., Chen, K., & Lee, H. (2012). **The Impact of Video Clip Instruction on Understanding Customer Relationship Management (CRM) Software for Brand Management**. *Journal of Integrated Enterprise Systems,* (1)1.

Shing, M., Shing, C., Chen, K. L., & Lee, H. (2011). **A Study of Risk Management Models**. *International Journal of Electronic Commerce Studies,* 2(1).

Shing, M., Shing, C., Chen, K. L., & Lee, H. (2010). **Simulation of a Two-Category Secured Access Database**. *Communications of the IIMA, 6(3),* 1-12.

Yang, J., Qin, Z., & Lee, H. (2009). **Coordination of perishable product returns with imbalance information**. *International Journal of Management and Enterprise Development,* 7(3), 281-298.

Shing, M., Shing, C., Chen, K., & Lee, H. (2009). **Confidentiality Modeling and Simulation and Validation in a Simplified Database Access**. *International Journal of Computational Biology and Drug Design,* 2(3), 252-263.

Shing, M., Shing, C., Chen, K., & Lee, H. (2007). **Security Modeling on the Supply Chain Networks**. *Journal of Systemics, Cybernetics and Informatics,* 5(5), 53-58.

Shing, M, Shing, C., Chen, K., & Lee, H. (2007). **Obstacle of Team Teaching in Information Security**. *Journal of Systemics, Cybernetics and Informatics*, 5(5), p.81-86.

Chen, K. L., Shing, M., Shing, C., & Lee, H. (2007). **Modeling in Confidentiality and Integrity for a Supply Chain Network**. *Communications of the IIMA*.

He X., Yang J., Lee, H. (2007). **Social Reference Group Influence on Mobile Phone Purchasing Behavior: A Cross-Nation Comparative Study**. *International Journal of Mobile Communications*.

Shing, M., Shing, C., Chen, K., & Lee, H. (2007). **Issues in Information Security Curriculum: Collaborative Learning and Team Teaching**. *International Journal of Innovation and Learning*, 4(5).

Lee, H., Chen, K., & Yang, J. (2006). **Teaching Enterprise Resource Planning (ERP) Systems in the Supply Chain Management Course**. *Communications of the IIMA*, 6(3).

Lee, H., Chen, K., Barnes, C. & Hsieh, C. (2005). **A Mission-Based and Student-Oriented Model for E-Commerce Curriculum Development**. *International Journal of Innovation and Learning*, 2(2), 186-196.

Chen, K., Lee, H., & Barnes, C. (2004). **An Analysis of the Most Popular Internet Business Models Used in the Travel Industry**. *Midwestern Business and Economic Review*.

Zhang, C., Chen, K., Lee, H. (2004). **Semi-Automatic Query Expansion Approach for Web-Based Information Retrieval**. *Communications of the IIMA*, 4(4).

Lee, H., & Etnyre, V. (2003). **A Study of .Net Framework, XML Web Services and Supply Chain Management**. *Journal of International Technology and Information Management, 12(1),*137-153.

Chen, K., Etnyre, V., & Lee, H. (2003). **Security Management in Intranet Systems.** *Communications of the IIMA,* 3(1).

Lee, H., Li, K., Gossage J. L., Chen, K., & Zhang, W. (2002). **An Engineering Knowledge-Based System for Supply Chain Management Support in Chemical Industry**. *Communications of the IIMA*, 2(1), 15-24.

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Yang, J., & Lee, H. (2002). **Identifying Key Factors for Successful Joint Venture in China: An Analytic Hierarchy Process (AHP) Approach**. *Industrial Management & Data Systems*, Vol. 101, No. 2.

Yang, J., & Lee, H. (2001). **A Computer-Based Decision Support System for Truck Dispatching**. *The Academy of Information and Management Sciences Journal*, Vol. 3, No. 1.

Chen, K., Lee, H., & Mayer, B. (2001). **The Impact of Security Control on Business-To-Consumer Electronic Commerce**. *Human Systems Management*, Vol. 20, p.139-147.

Chen, K., Lee, H., Yang, J., & Mayer, B. (2000). **An Investigation of College Students' Perception of Business-to-Consumer E-Commerce**. *Communications of the ICISA*, III (1).

Price, D., Mayer, B., Lee, H., & Moore, G. (2000). **An Analysis of Teen Smoking Demand in Southeast Texas**. *Southwestern Economic Review*, 27(1).

Lee, H., Mayer, B., Yang, J., Chen, K., & Lee, C. (1999). **College Students' Perception of Electronic Commerce and Internet Purchasing.** *The Academy of Information and Management Sciences Journal*, 2(1), 8-25.

Lee, H. & Deane, R. (1999). **Customer Order Acceptance Decision Models for a Process-Focused Production System**. *The Academy of Information and Management Sciences Journal*, 2(2), 41-62**.** (One of the Best Paper Awards in the 1999 National Conference of Academy of Information and Management Sciences, Myrtle Beach, SC, April 1999)

Mayer, B., Price, D., Lee, H., and Gary Moore. (1998). **A Study of the Impact of**

Cigarette Price Increases on the Smoking Behavior of Southeast Texas Teenagers. *Midwestern Business and Economic Review*.

Yang, J & Lee, H. (1997). **An AHP Decision Model for Facility Location Selection**. *Facilities*, 15(9/10), 241-254.

Lee, H., Osborne, L., & Chen, K. (1996). **From a Multimedia Learning System to a Distance Tutoring System for the POM Course**. *The Communications of the ICISA.*

Howard, J., Lee, H., & Williams, H. (1995). **Employee Assistance Programs and Employee Satisfaction: How Employees are Perceiving these Services**. *American Society of Business and Behavioral Sciences Perspectives Journal*, 1(1).

Lee, H., & Howard J. (1994). **Measuring the Quality of Services: The Use of Internal Climate**. *Benchmarking for Quality Management and Technology*, 1(3), 22-34.

Wang, J., Yang, J., & Lee, H. (1994). **Multicriteria Order Management Support in Over-Demanded Job Shops: A Neural Network Approach**. *Mathematical and Computer Modelling*, Vol. 19, No. 5, p.1-19.

Lee, H. & Wellan, D. M. (1993). **Vendor Survey Plan: A Selection Strategy for JIT/TQM Suppliers**. *Industrial Management & Data Systems*, 93(6), 8-13.

Talbert, G., Lee, H., & Barnes, C., (1993). **Multimedia Use as a Teaching Aid in the Public Schools in the State of Texas**. *TBEA Journal*, 1(1), p.1-8.

Pace, L. A., Suojanen, W. W., Bessinger, R. C., Lee, H. & et al. (1986). **The Type A Manager as Addict**. *Employee Assistance Quarterly*, 2(2), 47-63.

2. Featuring Article on the Newsletter:

Lee, H. (1997). "**A Test-Based Distributed Multimedia Tutoring System for the Production and Operations Management**," *Decision Line*, 28(5).

3. Refereed Publications (Between Journals and Proceedings)

Chen, K., Lee, H., Shing, C., & Shing, M. (2010). **A Study of Identity Management Features in ERP Systems**. *Issues in Information Systems*.

Lee, H., Dark, M., & Chen, K. (2005). **Incorporating Ethics into Management Information Systems Curriculum in Business Schools**. *Issues in Information Systems*, 6(1), 360-364.

Chen, K., Lee, H., & Barnes, C. (2002) **An Analysis of E-Commerce Strategy Used by Internet Travel Sites**. *Issues in Information Systems*, Vol. III, p.102-107.

Lee, C., & Lee, H. (2001). **Factors Affecting Enterprise Resource Planning Systems Implementation in a Higher Education Institution**. *Issues in Information Systems*, Vol. II, p.207-212.

Lee, H., Chen, K., & Barnes, C. (2001). **An Investigation of E-Commerce Curriculums in National Colleges of Business**. *Issues in Information Systems*, Vol. II, 213-219.

Cotter, C., Chen, K., & Lee, H. (2000). **The Use of the Enterprise Resource Planning Software in Three Chemical Companies**. *Issues in Information Systems*, Vol. I.

Barnes, C., Lee, H., & Harris, T. (2000). **An Analysis of Implementing Internet-Based Distance Learning Courses**. *Issues in Information Systems*, Vol. I.

4. Recent Presentations

"The Use of Virtual Reality for the Instruction of Network and Security Implementation" presented in ICHITA, Western Michigan University, Kalamazoo, Michigan, November 4, 2022

5. Research Grants:

Huei Lee, "*The Use of Virtual Reality for the Instruction of Network and Security Implementation*", received $1,885.96 from eFellows grant, Eastern Michigan University, March 5, 2021.

Part of the team to receive the grant $72,000.00, "***Immersive Community, Culture, and Care Experiences for Undergraduate Nursing Students: The 360-degree Difference,***" from the ACNC2-2021, Michigan Department of Health and Human Services, February 2021. Dr. Tsu-Yin Wu at School of Nursing is the lead investigator for the grant.

"**The Establishment of an Information Analytics Web Hub for Supply Chain & Logistics Businesses in Michigan,** "received a grant of **$2,000** from the Center for Entrepreneurship, EMU, 2015.

Continued Software Grants from Microsoft for Dynamics AX, GP, and CRM software **($418, 934.00**) from Microsoft Dynamics Academic Alliance, 2014-2015.

e-fellow grant, Eastern Michigan University, $2500, Winter 2014.

Research Grant from Microsoft for Azure operating systems, March 2013 ($**34,440.00**).

"**An Investigation of the Usefulness of Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) Software**, "received Small-business Technology Grant from the Center for Entrepreneurship, Eastern Michigan University ($2,000), 2012.

Received software Microsoft Dynamics AX, GP, CRM from Microsoft Dynamics Academic Alliances and annual support plan ($480,000), 2011.

Mobile Computing Project (Apple iPad), EMU Mobile Computing Team, Eastern Michigan University, received an Apple iPad from the e-fellow grant.

"**The Virtual Labs and Remote Access for Students**," received the E-fellow Awards, Eastern Michigan University, 2009 ($1,900).

"**A Comparison of Various Remote-Access Methods for Employee Training**," COB 2007 Summer Equipment Support Grant, Eastern Michigan University ($700).

"**An Investigation of the Effectiveness and Usefulness of the Supply Chain Management (SCM) Systems in Michigan**," Faculty Research/Creative Fellowships, Eastern Michigan University, 2006-2007 ($1,200).

"**An Investigation of Perception of IS Faculty toward Ethics in Information Systems Curriculum**," COB 2005 Summer Equipment Support Grant, Eastern Michigan University ($200).

"**Designing and Enhancing a Hybrid/blended Course in IT Infrastructure and Security**," E-Fellow Award for $1,000.00, 2006, Eastern Michigan University, Ypsilanti, MI.

"**A Study of the Impact of Secured Wireless Communications on Customer Relationship Management (CRM) Systems,**" Faculty Research/Creative Fellowships, Eastern Michigan University, 2005-2006 ($1,200) and COB 2005 Summer Equipment Support Grant ($500).

"**Enhancing the Computer Information Systems Courses through the Advanced Telecommunication Technologies**," E-Fellow Award for $1,000.00, 2004, Eastern Michigan University, Ypsilanti, MI.

"**An Investigation of the Impact of Using Wireless and Hand-held Computers on Medical Record Input Systems**," Faculty Research/Creative Fellowships, Eastern Michigan University, 2003-2004 ($1,000).

"**An Investigation of the Effectiveness and Usefulness of the Enterprise Resource Planning (ERP) Systems in Texas**," the Texas Research Enhancement Grant, Lamar University, 1999-2000. ($5,000) (On a competitive basis)

"**A Study of the Impact of Internet-based Marketing Information Systems on Consumer Purchasing and Communication**," the Texas Research Enhancement Grant, Lamar University, 1997-1998. ($5,000) (On a competitive basis)

"**An Investigation of the Impact in Using a Local Area Network for Multimedia Applications,**" the Texas Research Enhancement Grant, Lamar University, 1995-1996. ($5,000) (On a competitive basis)

Received the Texas Research Enhancement Grant, Lamar University, 1993-1994.

($5,000) (On a competitive basis)

"**An Investigation of the Marketing and Information Management Strategies on the Implementation of a Just-In-Time (JIT) Delivery System,**" the Texas Research Enhancement Grant, Lamar University, 1992-1993. ($5,000) (On a competitive basis)

"**Quality Measurement in the Service Sector**," (with Rolf F. Holtz and Carl B. Montano) Productivity and Quality Center, John Gray Institute, Beaumont, Texas, Summer 1992, 1993. ($3,500 and $3,700)