

UNIVERSITY OF THE  
DISTRICT OF COLUMBIA  
SCHOOL OF BUSINESS AND PUBLIC ADMINISTRATION



**2019**

**Inaugural Business Firebirds**

**D<sup>3</sup> Innovation Conference**

*Theme: Global Business Innovations with Sustainable Impact*

**Thursday, April 25, 2019**



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*Vice President for Research and Graduate Programs, University of the District of Columbia*

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*Keynote Speaker*

*Chief Strategy Officer, FCB Global, New York*

Mr. James Hoadley

*Associate Director, Center for International Business Education and Research (GT-CIBER),  
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Dr. Anna Helm

*Faculty Director, George Washington Center for International Business Education & Research  
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Mr. Marcus Ballenger

*Commissioning Editor, Palgrave Macmillan, New York*

Mr. Sam Quinney

*Interim Director, The Lab @ DC, Government of the District of Columbia*

Dr. Denise Bedford

*Adjunct Faculty, Georgetown University; Retired Goodyear Professor of Knowledge Management,  
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Ms. Farah Gheriss

*Special Assistant to the CIO at the International Monetary Fund*

**SBPA FIREBIRDS D<sup>3</sup> INNOVATION CONFERENCE SPONSORS**

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### Thank You SBPA Conference Organizing Team!



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## DEAN'S WELCOME



Welcome to the School of Business and Public Administration 2019 Inaugural Business Firebirds D<sup>3</sup> Innovation Conference. D<sup>3</sup> stands for Design Thinking: to define, design and develop. The D<sup>3</sup> conference is a hallmark of our commitment to an experiential learning environment at the School of Business and Public Administration. It gives our students the opportunity to participate, collaborate and display their innovative ideas. Our students are excited and looking forward to working with our judges. I am proud of the work of our students.

On behalf of the UDC-SBPA, I would like to thank our distinguished guests for taking time to share their expertise, skills, and wisdom with us. Your support helps cultivate academic advancement and to nourish intellectual curiosity and interest.

The organizing team has put together an exciting conference for you. The conference is a display and representation of our dedication to learning excellence and our commitment to quality education and scholarship. Thank you for joining us today!

Sincerely,

A handwritten signature in black ink, appearing to read "Mohamad Sepehri". The signature is fluid and cursive, with a large initial "M" and "S".

Mohamad Sepehri, Ph.D.  
Dean, School of Business and Public Administration  
[mohamad.sepehri@udc.edu](mailto:mohamad.sepehri@udc.edu)

## CONFERENCE CHAIR WELCOME



It gives me immense pleasure to welcome you to our 2019 Inaugural Business Firebirds D<sup>3</sup> Innovation Conference. The theme of our inaugural conference is “Global Business Innovations with Sustainable Impact”. At the School of Business and Public Administration (SBPA), students have the opportunity to develop a deeper understanding of the theories and concepts they learn and how these can be applied in specific real-life business situations. Through opportunities like this conference, SBPA students are empowered to discover the rigor and rewards of exploration through scholarship and to showcase their research beyond the classroom. I sincerely appreciate the tremendous effort and preparation of the students and their faculty advisors. My special thanks to our Dean - Dr. Mo Sepehri, and Department Chair – Dr. Jian Hua for their support, and to the SBPA faculty and staff involved in organizing and planning this event. I also want to thank our distinguished judges and guests for their encouragement to all our students.

Sincerely,

A handwritten signature in black ink, appearing to read 'Amit Arora', with a long horizontal line underneath it.

Amit Arora, Ph.D.

Associate Professor of Supply Chain Management

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## CONFERENCE JUDGES



### **Dr. Victor R. McCrary, Jr.**

Dr. McCrary, Jr. is the Vice President for Research and Graduate Programs at the University of the District of Columbia, leads the growth, development, direction and oversight of the University's research enterprise. He has held similar research leadership positions at the Johns Hopkins University Applied Physics Laboratory, Morgan State University, and the University of Tennessee. He is a change agent and serial innovator, responsible for developing comprehensive, sustainable research strategies, fostering trans-disciplinary research, and expanding research programs via engagement with federal and state agencies and private entities, including his significant contributions to Morgan State University becoming one of only 130 universities nationwide to have an R2 status in the Carnegie Classification of

Institutions of Higher Education. Dr. McCrary served two terms as the national president of the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE). He is a Fellow of the American Chemical Society. He received his doctoral degree in chemistry from Howard University, a master's degree in engineering management from the University of Pennsylvania, and a bachelor's degree in chemistry from The Catholic University of America.

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### **Ms. Vita Harris (Keynote Speaker)**

Ms. Harris is the Global Chief Strategy Officer at Draftfcb based in the New York office. She is responsible for the overall direction of strategy, planning, and research at the agency. With over 25 years of experience, she served an integral dual role during the merger of Draft and Foote, Cone and Belding (FCB). Prior to the merger of Draft and FCB in 2006, she served as Executive Vice President and director of Insight Services at Draft New York. There she pioneered a groundbreaking approach called Behavior Path Marketing<sup>SM</sup> that mines consumer insights to create fresh, relevant, and strategic marketing communications programs. She has developed innovative tools and techniques resulting in transformational strategies and high ROI for

various clients. In recognition of her vast accomplishments, she was previously named one of The Network Journal's "25 Influential Black Women in Business," recognized as a 2010 ADCOLOR Award Legend, and was cited in the 2011 Power Issue of Black Enterprise as one of its "Top Executives in Marketing and Advertising." She is staunchly committed to diversity and inclusion efforts at Draftfcb. She is chair of the Education and Cultural Awareness team and a member of the Executive Diversity Council. In addition, she serves as an advisor to Draftfcb's affinity groups, ensuring that diverse perspectives are fundamental to the agency's culture and business. She was recognized by the Girl Scout Council of Greater New York as a 2009 "Woman of Distinction."

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### **Mr. Marcus Ballenger**

Marcus joined Palgrave Macmillan in 2015 and commissions scholarly business content from authors based in the Americas. He welcomes proposals from all areas of business, including HR, entrepreneurship, innovation, international business, marketing, big data, sport management, and more. He earned his bachelor's from Emory University, USA and his master's from the University of Westminster, UK.



**Dr. Denise Bedford**

She is currently an Adjunct Professor, Georgetown University’s Communication Culture and Technology program; adjunct faculty at the Schulich School of Business, York University; Visiting Scholar at the University of Coventry; and a Distinguished Practitioner/Virtual Fellow with the U.S. Department of State. In 2010, Dr. Bedford retired as Senior Information Officer, World Bank. In 2015, she retired from her role as Goodyear Professor of Knowledge Management, Kent State University. Dr. Bedford also has worked for Intel Corporation, NASA, University of California Systemwide Administration, and Stanford University. She currently serves as an Associate Editor of the Journal of Knowledge Management. Her educational background includes a B.A. triple major in Intellectual History, Russian Language, and German Language; an

M.A. in Russian and East European History; an M.S. in Information Science; and a Ph.D. in Information Science with focus on Systems Analysis and Design, and Economics of Information.



**Ms. Farah Gheriss**

She is a Special Assistant to the CIO at the International Monetary Fund with more than 23 years of experience in Knowledge Management, Information Architecture, IT Strategy and Governance, Enterprise Architecture. She works continuously towards applying best practices to help operationalize the IMF’s knowledge management strategy. Farah also has extensive budget management and IT project experience involving structured and unstructured information. She holds an MLIS from Catholic University an MS in General Management, and is fluent in Arabic, French and Spanish.



**Dr. Anna Helm**

Dr. Helm is Assistant Teaching Professor of International Business at the George Washington University (GW) as well as the Faculty Director of GW’s Center for International Business Education & Research (GW-CIBER), one of 15 CIBERs in the United States funded by the U.S. Department of Education. She teaches courses on international marketing management, green business, the cultural environment of international business, and foreign market analysis. She has developed and taught several online courses and regularly offers courses with real client projects. Since 2010, she has taught international consulting courses in Sweden focusing on marketing strategy in both the CleanTech and Healthcare industry. Originally from Sweden, Dr. Helm holds a MSc in International Business and Economics with German from Lunds Universitet, Sweden,

as well as an MA in Germanic Studies from the University of Maryland. She received her PhD from Georgetown University in 2002. Prior to joining GW’s School of Business (GWSB) she was the Director of the Business, Culture and Languages Program at the University of Maryland, College Park. Professor Helm is pursuing research on cross-cultural differences in consumer perceptions of green products, sustainability innovation, and CleanTech marketing strategy. She is the Principal Investigator for a Teagle Foundation Grant titled “An Internationalized Liberal Arts Curriculum for Undergraduate Students,” with the University of Miami and Washington & Lee University. The goal of the grant is to deeply integrate liberal arts into the undergraduate business curriculum at the GW School of Business and its partner institutions.

## CONFERENCE JUDGES



### **Mr. James Hoadley**

Mr. Hoadley has served as the Associate Director of the Center for International Business Education and Research (GT CIBER) since 2005. Prior to that, he had extensive international and overseas business experience, including 8 years living and working in Japan for the Seiko EPSON Corporation. During his decade and a half tenure with GT CIBER, he has spoken with a wide range of people, including IMF President Christine Lagarde and the former President of Singapore, H.E. S.R. Nathan. Jim serves on the boards of multiple organizations focused on international business in the Atlanta area, including the Metro Atlanta Chamber Global Commerce Council, the ORBATL Metro Atlanta International Trade Initiative, the Japan America Society of Georgia, the USA India Business Summit, and the regional chapter of AIESEC. James started the Georgia Tech International Practicum/Global Consultancy Project, which connects 16 MBA student project teams with real-world business projects and has worked in over 14 countries.



### **Mr. Sam Quinney, MPP**

Mr. Quinney is the Interim Director of The Lab @ DC. Under his leadership, The Lab works to generate timely, relevant, and high-quality evidence to improve lives in the District. He joined the Lab in January 2016 as its first full-time employee. Prior to joining The Lab @ DC, he worked at the US Department of Education (ED) and White House Social and Behavioral Sciences Team. In behavioral science, he worked to embed behavioral insights and rigorous testing within the department's outreach to struggling student borrowers. In K-12 education, he contributed to the development and evaluation of many ED initiatives related to school turnaround, high school graduation, teacher preparation, and college choice.

He previously worked as a Fellow under Chicago Mayor Rahm Emanuel, where he helped design a more cost-effective use of commercial loading zones and a 311 data tool used to predict and prevent outbreaks of rodent activity across the city. Prior to living in Chicago, he was a 7<sup>th</sup> Grade U.S. History teacher in Philadelphia and a Coordinator for a college readiness program serving low-income youth from neighborhood high schools.

He was a 2013 Presidential Management Fellow and a 2007 Teach for America Corps Member. Sam holds a B.A. in political science and writing from Villanova University, a secondary teaching certification from University of Pennsylvania, and a Master of Public Policy from the University of Chicago. He lives in Ward 6 in Capitol Hill East with his wife, Kelly, newborn son, Isaiah, and their dog, Nova.

## CONFERENCE AGENDA

**Thursday, April 25, 2019**

**SBPA, Building 38, 2<sup>nd</sup> Floor, Windows Lounge**

11:30 am	Lunch and Posters Set-up
12:00 pm – 12:05 pm	Welcome – Dr. Mo Sepehri, Dean, School of Business and Public Administration
12:05 pm – 12:10 pm	Welcome - Dr. Victor McCrary, Vice President for Research & Graduate Programs at the University of the District of Columbia
12:10 pm – 12:25 pm	Introduction of Judges and Keynote Speaker
12:25 pm – 12:45 pm	Keynote by Ms. Vita Harris, Chief Strategy Officer, FCB, New York
12:45 pm – 1:00 pm	Q&A with Keynote Speaker
1:00 – 3:00 pm	Poster Competition
3:00 – 3:30 pm	Closing Remarks and Awards Ceremony

**1. Ideate-Generate: Design Thinking and User Experience (UX) for Sustainable Impact on Global Product Development of Wearable Technologies in the Healthcare Industry**

**Alexandra Washington and Samira Soumahoro**

*Faculty Advisor: Dr. Anshu Arora*

Recently user experience (UX) has become a critical component of product innovation. Research and development teams often use this data to help determine a product’s potential prior to going to market. As companies are increasingly becoming global, products and services must be developed to meet the needs of global users. Understanding how the country of origin impacts a specific user’s experience and their desires is just as important to new product development. This paper examines how user experience impacts the development of new innovations globally. Additionally, we examine and address the following research questions:

- How do companies ideate and generate design thinking through UX for new product development worldwide?
- How does the UX data collected from user feedback of users around the world encourage ideas for new product development?
- How can companies redesign and redevelop products to meet new user needs, or generate raw ideas for designing new products designed based on UX.?

Our research focuses on an innovation idea based on UX in the wearable technologies industry, more specifically those used in and created for, the health care industry, across both developed and emerging economies.

**Keywords:** *ideate, generate, user experience, raw idea, design thinking, innovation, user needs, world economies*

**2. Innovation in Fleet Management Operations: The Role of Autonomous, Electric and Solar Vehicles**

**Diego Allen and Ndi Akpan**

*Faculty Advisor: Dr. Amit Arora*

The purpose of this research is to illustrate the benefits of autonomous, electric, and solar powered vehicles on fleet management. Research shows that by 2030, 95% of traveler miles trekked in the United States will be provided by autonomous electric vehicles owned by fleets. Research suggests that natural synergies between autonomous, electric and solar powered vehicle exist. Autonomous vehicles are a sustainable approach to innovation in the future of fleet management. Inducting autonomous vehicles (AV) into fleet management operations such as public transpor-

tation, ride sharing, and delivery trucks may create an infrastructure that will improve fleet management. Our research addresses the following questions:

1. How can autonomous vehicles positively benefit public transportation, ride sharing, and delivery fleets?
2. What sustainable benefits do autonomous vehicles offer fleet management?
3. What natural synergies exist between autonomous, electric, and solar powered vehicles?
4. How can autonomous vehicles affect fleet management operations and supply chains?

We propose that autonomous vehicles positively affect fleet management operations and supply chains by providing sustainable and cost saving benefits for the consumers as well as for companies. Our research also proposes an innovation based on collaboration with autonomous vehicles and fleet management that may possibly result in further benefits to consumers and companies.

**Keywords:** *autonomous, electric, solar, vehicles, fleet management, sustainability*

**3. Modular Product Design: A New Wave of Innovation in Global Product Design**

**Dominika Hadnadova and Gabriella Gabriel**

*Faculty Advisor: Dr. Anshu Arora*

This research examines the effect of technology versus design innovation and their synergistic interaction. When conducting an innovation’s success, it is important to use a raw idea. We define an “idea” as an opportunity to create value through further investment. Design innovation is used to help consumers realize the benefits of technology. Product design is a source of competitive advantage for companies and is an important driver of company performance. The architecture of a product is the design and specification of inherent subsystems, components, and interfaces between subsystems. Product symbolism refers to the image of the product and associations related to it. Modular Product Design subdivides a system into smaller parts called modules or skids that can be independently created and then used in different systems. The research addresses the following questions:

- How can product design improve customer retention and company performance?
- What is the impact of a raw idea in technology or design innovation?
- How can modular product design create a sustainable impact for developed and emerging economies?

Finally, our research focuses on an innovation idea based on modular product design in consumer electronics industry across emerging economies.

**Keywords:** *Product design, Innovation, Raw idea, New Product Evaluation, Modular Product Architecture, IT Infrastructure, Digital Design, Consumer Behavior*

#### **4. Impact of Innovation and Sustainability on Automobile Supply Chains**

**Elvin Arbaiza, Kaleef Morse, and Monica Wiggins**

*Faculty Advisor: Dr. Amit Arora*

The automobile industry is considered as one of the most important sectors for the country's trade and economy, helping shape individual lives, cities, communities and the economy. This research analyzes the impact of sustainability, innovation and Green Supply Chain Management (GSCM) in the automobile industry over the last decade, and into the future. For a company to be sustainable in the automobile industry, it requires significant investments in research and development that need to be justified and recovered through the benefits that will result from the sustainability techniques adopted. The implementation, design, and diffusion of the environmental technologies in the automobile industry, in a large percentage are dependent on the configuration of the production system that is present. The pressures on companies to be more sustainable are being felt worldwide, and especially in the automobile industry. Our research argues that innovation and sustainability in automobile industry reduces the negative environmental risks and impacts. The question constantly arises as to how vehicles can be made greener, cleaner, and more efficient for the consumer as well as the company, along with having a positive impact on the company's bottom line. Critical Success Factors (CSF) are paramount to the Green Supply Chain Management (GSCM) in the automobile industry. As such, the research sheds light on new laws, rules and regulations that have forced automobile industry to produce environmentally friendly products. The research addresses the following questions:

- What is the importance of innovation in the automotive industry?
- What is the importance of being sustainable in the automotive industry?

**Keywords:** *sustainability, innovation, green supply chain management, automobile industry, environmental factors, economic factors*

#### **5. Seeing is Believing: The Disruptive Effect of Sustainable and Functional Product Design in Electric Bikes for Emerging Economies**

**Delonte D. Bright and Edna Laetitia Aude Diouf Oganaga**

*Faculty Advisor: Dr. Anshu Arora*

The bicycle industry has improved over the years, manufacturers have created different types of new bikes such as: the Juliet bike for women; and the Revive E-bike. Sustainability and convenience are key in a world where innovations benefit not only consumers, but also the economy and the world. Product design is the detailed specification of a manufactured item's parts and how the item will perform its intended functionality in an efficient, safe and reliable manner. E-bikes by design in a developing economy can become a sustainable solution for consumers that have low monetary wealth, while also lowering detrimental impact on the plan climate. This research addresses the following questions:

- How important is a product's design to a product's value and lifespan?
- How does implementing innovations in E-Bikes affect emerging economies?

The research provides managerial implications based on customers habits and attitudes towards new products such as the E-Bike in developing economies.

**Keywords:** *product design, functionality, electric bikes, sustainable transportation, emerging economies*

#### **6. Innovations in "Last Mile Logistics" of E-commerce Supply Chains**

**Prim Patanachaisiri and Samira Soumahoro**

*Faculty Advisor: Dr. Amit Arora*

E-commerce is the process of embracing the use of technology in business transactions. This paper focuses on the accelerating trend of e-commerce and the impact it has on a company's last mile logistics. Previous and current research has explored the impact of this new development on supply chain process and management. E-commerce has made it quite easy for the supply chain departments in various organizations to enhance their services. The advent of technology has resulted in relatively easy transfer of information between the various functions of an organization

and resulted in the supply chains to be enhanced. This research explores substitutable options in last mile logistics to possibly lower the cost and enhance overall benefits to stakeholders, as compared to traditional home delivery method in a supply chain. The paper focuses specifically on two innovative methods: crowdsourcing and the use of parcel lockers. The authors compare the advantages and disadvantages of each method and analyze case studies of such methods that are being adapted into practices.

**Keywords:** *innovation, e-commerce, last mile logistics, crowdsourcing, parcel lockers*

### 7. The Lucrative Components of Unique Product Design

**Cameron Brock and Elvin Arbaiza**

*Faculty Advisor: Dr. Anshu Arora*

Product Design is a company's key competitive advantage when other products have the same technology, price, performance, and features. In our research, we examine design dimensions of a new product and how these new product design dimensions can positively or negatively influence consumer willingness to purchase that product. Brand Attitude is also influenced by design dimension, which has a positive influence on purchase intention and word of mouth. Product design combines aesthetics along with the functional and symbolic dimensions of a product. Innovation is no longer the subject of developed or industrialized countries. Innovations originate from both the developed and emerging economies. Research and development (R&D) capabilities vary across developed and emerging economies. The research addresses the following questions:

- How can we apply unique product design and the utilization of external R&D consultants into the consumer electronics industry to have a sustainable impact?
- How can we utilize formal and informal R&D organizational mechanisms to design a measurably unique product in the consumer electronics industry that will have a sustainable impact?

How can we enhance design newness and technical newness innovations in developed and emerging economies?

As such, the research shed relevant light to innovators, researchers and business executives on the design patterns preferred in different market situations in different parts of the world (developing and developed countries). It helps these stakeholders understand the market implications through understanding consumer patterns of acceptance and preference to the varied design and technical newness concerning these market situations in the world.

**Keywords:** *Country-Of-Origin (COO), technical newness,*

*design newness, product design, innovation*

### 8. Transparent Agri-Food Supply Chain: Role of RFID and Blockchain Technology

**Carla Jammille Arapiraca and Wanya Hamlett**

*Faculty Advisor: Dr. Amit Arora*

This research explores the use of RFID and Blockchain technology in agri-food supply chain. The paper focuses on the benefits, functionality, applications, and problem solving using these technologies in the agri-food sector. In the past, food transportation over long distances were considered a problem, since perishable items require precautions during the entire process, which would otherwise impair food quality, bringing contamination and associated problems to consumers and the market. The development of the Radio Frequency Identification Technology (RFID) and Blockchain has helped the companies to have better control over details transportation parameters such as temperature, traceability and even perishability of each food item in a container. It has simplified the process by virtualizing everything and eliminating on site verifications resulting in food being transported over long distances (e.g. Norway to Brazil) without problems in quality. The purpose of this research is to illustrate the application of new technology solutions for increasing transparency along agri-food supply chain.

**Keywords:** *food supply chain, RFID, blockchain, agri-food, transportation, perishable.*

### 9. Vision – Knowledge – Innovate: Utilizing Visionary Knowledge Integration for Product Innovation in Developed Versus Emerging Economies

**Monica Wiggins and Ka'leef Stanton Morse**

*Faculty Advisor: Dr. Anshu Arora*

New product design impacts various levels of design newness. There is a distinct correlation between the consumer's involvement in innovative product design and new product performance. Product design, the constitutive elements of a product, can be measured upon three consumer-perceived design dimensions: aesthetics, functionality, and symbolism. To promote innovation, a comparative analysis of the visual attributes of the product's similarities to its competitors or category members, known as design newness, must be used. Innovative product design requires visionary innovation leadership, the ability to create something that is realistic, credible and attractive. Crucial to visionary leadership is knowledge integration, a vital process through which the exchange of experience and expertise helps translate new ideas into new outcomes such as new products or new services. There are direct links between vision-

ary innovation leadership and knowledge integration and links between connectivity and product innovation. The research addresses the following two questions:

- How does the process of knowledge integration influence new product design dimensions?
- How do these product design dimensions impact the consumer's willingness to purchase (WTP), word of mouth (WOM), and purchase intentions?

How can we utilize vision-knowledge-innovate framework for product innovation in developed versus emerging economies?

Our research focusses on vision-knowledge-innovate framework and proposes an innovation idea based on utilizing visionary knowledge integration for product innovation in the fashion industry across developed versus emerging economies.

**Keywords:** *product design, design newness, visionary innovation leadership, knowledge integration*

### **10. Mass transit network accessibility and reliability: Role of sustainable transportation**

**Edna Laetitia Aude Diouf Ogandaga and Ilham Fermas**

*Faculty Advisor: Dr. Amit Arora*

A well-functioning transit system is important for the growth of a city and to help the ensuing increase in travel demand. To meet this demand, mass transit networks must create new and more complex systems. Thus, these changes in the transit network system lead to a change in network accessibility and reliability. This research proposes integrated measures such as MASSRA or mission, asset and system specific risk assessments which is used to identify high-risk focus areas within a mode of transportation. Our research focuses on examining how transport network planning can improve the network functionality and create a well-balanced, accessible and reliable system; and it investigates the future of transportation in pursuit of a sustainable future. It also reviews the single most global and business concern, which is global warming. Because of the importance of transportation, logistics and supply chain in running of businesses, it draws a connection between them and the problem at hand. This research also expounds on the growing need for organizations to integrate environmentally sound choices into supply chain management. Our research addresses the following questions:

How can we create a more accessible and reliable mass transit system?

How important is transport network planning to create a well-functioning transport system?

Will sustainable transportation reduce operational costs for businesses?

**Keywords:** *Mass transit system, accessibility, reliability, MASSRA, Sustainable Transport, Global warming, supply chain management, logistics*

### **11. Ecological Friendly Innovation Adaptability in Global Business Environment**

**Sharadindu Saha and Gildas Bassole**

*Faculty advisor: Dr. Anshu Arora*

In this research, we focus on design newness and upcycling. Design newness is the degree to which a product exhibits visual attributes that are like those of competitors or other category members. Upcycling, on the other hand, is when products can be easily disassembled, sorted, and returned to the manufacturing stream without a loss in value to the ingredients. These two concepts are related to the resource-based view (RBV) and sow's ear hypothesis for helping organizational operations become more innovative and environmentally friendly. Through eco-friendly product development and transition from natural resource-based view (NRBV) to resource-based view (RBV), companies can focus on developing its internal resources (including innovative capability) which enables organization to innovate its product and bring significant changes in its design. Our research focuses on the following research questions:

1. What design initiatives companies can take to embed environment friendly practices across organization?
- 2.
3. How can we apply design newness and upcycling to the furniture industry in the context of emerging economies?

This research will help understand how to apply key concepts such as design newness and upcycling in the furniture industry in developing countries to help prevent an ecological disaster.

**Keywords:** *Resource Based View (RBV), sow's ear hypothesis, design newness, upcycling, innovation*

## 12. Supply Chain Innovation: Lowering Costs in U.S. Offshore Wind Farm Projects

**Dragana Simic and Mohammadali Shahbandi**

*Faculty Advisor: Dr. Amit Arora*

In 2016, wind power in the United States amounted less 5.55% of all generated electrical energy. As of January 2017, the generating capacity for wind power in the U.S. was 82,183 megawatts (MW). This capacity is exceeded only by China and the European Union. In addition to sizeable onshore wind resources, the U.S. has vast offshore wind potential due to strong, consistent winds off along the U.S. coastline. A report from the National Renewable Energy Laboratory showed that the U.S. has a potential offshore wind power capacity of 4,150 gigawatts (GW), four times the country's 2008 installed capacity from all energy sources of 1,010 GW. A report from the U.S. Department of Energy envisions that wind power could supply 20% of all U.S. electric power by 2030, with 4% of the nation's total electric power coming from offshore wind sources. Relatively high costs hinder offshore wind power development compared to onshore wind generation facilities. The capital cost of offshore wind power is around twice that of coastal wind energy projects. The higher price is due to increased investments in laying cables offshore, constructing expensive foundations at sea, transporting materials and turbines to the wind farm, and installing foundations, equipment and the turbines themselves. The turbines are also more costly. They need to be designed with additional protection against corrosion and the harsh marine environment to help reduce maintenance costs, which are also higher offshore. If offshore wind is to become truly competitive, capital and O&M costs need to be reduced. This paper presents a supply chain strategy that when implemented may help reduce the higher installation and maintenance costs of offshore wind farms.

**Keyword:** *Offshore wind farms, energy, cost*

## 13. How 'Bio-Sustainable' are you? Utilizing Biomimicry and Design Newness for Developing Sustainable Products

**Thomas Diego Allen and Andrea Williams**

*Faculty Advisor: Dr. Anshu Arora*

Product design allows for companies to gain an advantage over their competition and is a vital component of a company's performance. In several industries, new products are very similar in functional features but compete on their unique design. Research shows that consumers prefer high-level design newness in developed economies as compared to emerging economies. Scientists use biomimicry to drive environmentally sustainable product innovation as

well as increase the speed of front-end innovation. Biomimicry is a sustainable approach to innovation in the future of environmental products such as soaps, sanitizers, and everyday products that consumers use. Product design and design newness will benefit companies if the products are sustainable. Our research addresses the following questions:

1. Do the dimensions of a product design positively affect consumers' willingness to pay for the product? Should design newness be considered as a dimension of product innovativeness?
2. Is biomimicry used by companies to drive environmentally sustainable product innovation?
3. Are consumers attracted to new designs for sustainable products?

We propose that sustainable product design positively affect consumers' willingness to pay for the product, purchase intentions, and word of mouth, both directly and indirectly through brand attitude. Our research focuses on an innovation idea based on collaboration in sustainable product design in the robotic lawnmower industry across developed and emerging economies.

**Keywords:** *bio-sustainable, product design, design newness, biomimicry, sustainable products*

## 14. Innovation in Retail Industry Supply Chain: Exploring the Impact of RFID Adoption and Implementation

**Jason Mumford and Valarie Munroe**

*Faculty Advisor: Dr. Amit Arora*

The success of the retail industry is premised on its ability to meet the demands of consumers in a timely manner with accuracy. Inventory inaccuracy presents great challenges in a business's supply chain, making it harder to manage. This paper provides a theoretical analysis of the impact RFID has on the supply chain of retail industries, through literature review of scholarly journals. According to past research, RFID technology has been used extensively in the retail industry to enhance the supply chain operations of fashion and other consumer goods. With the implementation of RFID technology system at the item level, companies such as Macy's and Mark & Spencer saw significant improvement in the management of its inventory. Success such as phantom stock-outs were eliminated, misplaced items were easily located, and full backroom visibility was made possible. This research explores the pending benefits of automatic identification technology (AIT) such as RFID and how inventory accuracy for retailers were attained. It further shows how RFID technology enhanced the supply chain process through real-time visibility of demand, provide inventory control and auto-

matic filling of missing inventory etc., thus positively affecting the financial and overall operations of the retail industry. Conversely, investing and implementing the RFID technology comes at considerable cost. However, based on the research conducted, many companies in the retail industry boast in its cost savings through implementation of the RFID technology; for example, labor reduction and enhanced inventory management. Overall, many companies felt that the benefits outweigh the cost and confirms that there have been significant returns on their investments in this technology. Irrespective of the cost factor, this research found that RFID is the innovative game-changer in the supply chain management process and its application has simplified retail supply chains.

**Keywords:** *radio frequency identification (RFID), supply chain management, inventory, retail, supply, demand, technology/innovation, automatic identification technology (AIT)*

### 15. Go Green! Environmentally Sustainable Technology as a Driver of Consumer Adoption

**Mohammadali Shahbandi and Dragana Simic**

*Faculty Advisor: Dr. Anshu Arora*

The main objective of this research is to examine the correlation between environmentally-friendly technology and consumer adoption of product innovation. In the 21st century, more and more consumers are expressing concern for global environmental impact of new products on the environment. We define "new" as "technical newness" (as opposed to design newness) and focus primarily on new materials and technological principles. We examine the correlation between consumer adoption of incremental versus radical. Product design is defined across three dimensions: aesthetics, functionality and symbolism. This paper examines how adopters of environmentally-friendly technologies assess these new product design dimensions in their adoption process. The research addresses the following questions:

- How does new product design relate to innovation and technology capability development in emerging economies?
- How does new product design impact innovations in automobile industry?

Finally, our research addresses how the recent increase in global concern for the environment has shaped innovative capabilities in automobile industry in emerging economies.

**Keywords:** *innovation, technical newness, design newness, new materials, environmentally- friendly technology, con-*

*sumer adoption, product design, early adoption*

### 16. To Collaborate or Compete? How Reduced Industry Competition Creates Organization Growth and Innovation for Emerging Economies?

**John Brooks and Ilham Fermas**

*Faculty Advisor: Dr. Anshu Arora*

In today's global world, it is essential to reduce competition and build networks or modular symbiotic supplier networks while creating innovative products. The authors delve further into the effects of collaboration versus competition to combat larger (international) competition while focusing on emerging and bottom-of-the-pyramid (BOP) economies. Emerging economies offers future business potential for global businesses to grow through innovative business models, social value creation, and urgent and innovative solutions created from alliances and collaborations or government, business corporations, non-government organizations (NGO), and communities. Companies like Danone, General Electric, Nestle, Unilever, and many other have developed innovative capabilities of reducing international competition leading to growth in emerging markets. Our research focuses on the following questions:

1. How can businesses create collaborative teams across global modular supplier networks in the electric bike (E-Bike) industry for fostering product innovation, better production, efficiency, and product development?
2. Does creation of modular supplier networks create opportunities for cutting costs?

How can reduced competition through global modular supplier networks create competitive advantage to offset threats from low cost competition in emerging economies? Long term cooperative agreements enable industry partners (companies, government, business corporations, NGO's, and communities) to reduce risks and share profits. Our research focuses on an innovation idea based on collaboration in global modular supplier networks in the E-Bike industry across emerging economies.

**Keywords:** *modular symbiotic supplier networks; collaboration; competition; business models of innovation; production efficiency; new product development; emerging and BOP economies*

**17. School-to-Prison Pipeline: A Significant Contributor to Crime and Recidivism Rates in the Nation's Capital**

**Shaun Richards**

*Faculty Advisor: Dr. Sylvia Benatti*

The contributions to the addition of African Americans to the school-to-prison pipeline has caused an increase in crime and recidivism rates in the Schools. Schools must gear towards the implementation of the Positive Behavioral Intervention and Supports frame (supported by the federal government), which involves the use of preventative discipline methods such as enhancing academics, lessening misconduct, and improved psychological behavior throughout local educational agencies to reduce in and out-of-school suspensions and expulsions. The Healthy School Survey enlightened the fact that 80 percent of the local teachers and 93 percent of DC Public Charter School Board teachers need more professional training in areas of substance abuse and brute force prevention.

Questions:

1. How does school suspension/expulsion rates affect the school-to-prison pipeline in DC?
2. Are DC school's suspension policies compatible to those presented on the Council of State government, and are they a precursor to DC Juvenile Crime rates and Recidivism?
3. What interventions can be implemented to ease our youths entering and leaving the juvenile justice system in the District of Columbia?

**18. Retooling energies in engagements with IFIs (World Bank and IMF) to address Governance and Rising Public Debt: the cases of Malawi and the DRC**

**Bernard Jappah**

*Faculty Advisor: Dr. Sylvia Benatti*

In recent decades, the rapid growth in poor country debt level and pervasive poverty have emerged as key issues of global concern. While many analysts believe that the debt burden is an impediment to economic growth and poverty reduction, others contend that for the poorest nations, other reasons such as weak political and economic institutions play significant roles in their current situation. In this vein, the purpose of the research was to identify the root causes of systemic poverty and elated public debt level in sub-Saharan Africa, heighten the policy debate, and

suggest some remedies. This study focused on Malawi and Democratic Report of Congo (DRC). Thirty countries (30) in Africa, including Malawi and the Democratic Republic of Congo have benefitted from debt relief initiatives: Heavily-Indebted Poor Countries Initiative (HIPIC), launched in 1996, and the Multilateral Debt relief Initiative (MDRI), launched in 2005. However, most continue to experience difficult economic, social, and political environments. They have had significant episodes of bad governance, as their former leaders provided the enabling environment for corruption to thrive, while embracing economic mismanagement at some point in their histories. In the wake of these developments, these countries economic indicators worsened, as debt levels continue to rise to levels of distress, while their people remained in abject poverty.

**19. The Economic and Political Benefits of LGBTQ inclusion in Developing Countries**

**B'journ Liverpool**

*Faculty Advisor: Dr. Sylvia Benatti*

Countries around the world are evolving. Here, in America, more than half of Americans under the age of five are of color, and by 2044 we will be a majority people of color nation. But while communities of color are driving growth and becoming a larger share of the population, inequality is on the rise and racial inequities remain wide and persistent. Dismantling racial barriers and ensuring that everyone can participate and reach their full potential are critical for the nation's prosperity. Equity, just and fair inclusion of all is essential to growing a strong economy and building vibrant and resilient communities. This study will look at the importance on ensuring the economic inclusion of Lesbian, gay, bisexual, and transgender people and how this can be beneficial to the economic and political cultures in developing countries.

**20. Strategic Human Resource Management and Non-profits: An Underused Tool to Address Organizational Challenges**

**Kathryn Wolff**

*Faculty Advisor: Dr. Sylvia Benatti*

Strategic Human Resources Management, known as SHRM, has emerged as a promising theory and practice for nonprofit leaders to implement to address these talent management challenges. In the context of the challenges of recruiting and retaining a talented workforce, coupled with the strong emphasis of employees as a nonprofit's most valuable asset, it makes sense that HR policy and

practice should be closely aligned to the strategic priorities of an organization. SHRM is a tool to assess and implement human resources activities that enable an organization to achieve its goals and promote organizational outcomes. The goal of this research project is to build on previous work in exploring the application of SHRM strategies in the nonprofit sector through a literature review and conduct new analysis of available data about the implementation of SHRM in nonprofits, with a goal of developing a future actionable plan for application within a local nonprofit organization. By analyzing data from nonprofit employees, this project hopes to illustrate the importance for nonprofit organizations interested in improving organizational effectiveness through the application of SHRM tactics.

### **21. The Effects of Food Insecurity on Young Children in the District of Columbia**

**Khadija Ismail**

*Faculty Advisor: Dr. Sylvia Benatti*

This Capstone Project will study Kid Power's VeggieTime program and the food insecurity problem affecting low-income families and neighborhoods in Ward 8 in the District of Columbia. Kid Power INC is a 501(c)(3) organization with over 16 years of experience in program and grant management. For the past 16 years, Kid Power has built and sustained long-term partnerships with various entities such as the District of Columbia government, specifically with Serve DC- The Mayor's Office on Volunteerism and with universities such as the University of Maryland and American University.

Kid Power offers their VeggieTime programming to the following schools:

LaSalle-Backus Education Campus (Ward 4)

Barnard Elementary School (Ward 4)

J.O. Wilson Elementary School (Ward 6)

Jefferson Middle School (Ward 6)

Stanton Elementary School (Ward 8)

Malcolm X Elementary School (Ward 8)

The aim of the project is to highlight the food desert problem and show the impact that projects such as VeggieTime has on young children. Through this study, the research will bring an awareness to the issue of food insecurity af-

fecting families and young children.

Research conducted will illustrate how hands-on activities and experiential learning taught through Kid Power's garden curriculum and STEM programs improve students' academic outcomes in the STEM related courses i.e. Math and Science.

Lastly, this research will show how after-school programs such as the VeggieTime program, teaches and helps students and their families to learn about nutrition, healthy practices, and provides an avenue for them to take fresh fruits and vegetables home to their families which can be difficult to in food desert areas. It will also show if any interest around physical fitness was inspired through the participation in Kid Power's after-school program.

### **22. Can Youth Violence Be Prevented If Early Intervention Is Implemented?**

**Ashanti Hoyles**

*Faculty Advisor: Dr. Sylvia Benatti*

Youth violence is a serious public health problem that affects mental, emotional, physical health and has economic consequences. According to data provided by the District of Columbia's Department of Health, the third leading cause of death in the District of Columbia are among 10-24-year-old, with homicide/assault being the leading cause, followed by accidents. The problems identified during the studying of this public issue varied but the most evidently seen is the continuation of youth violence, unregulated policies pertaining to the safety of youths and economic disparities among young of Ward 8. Coalitions and non-profits exist however, there is not a multitude of programs operating to help alleviate youth violence in Ward 8 of the District, but there is an abundance of research to suggest socioeconomic disparities, failure of regulatory policies and the recurrence of youth violence in the ward can the cost to society be reduced if youth violence is prevented? How can community enhancement decrease school violence? Can the development of interpersonal skills among adolescent youth reduce juvenile homicides in Ward 8? What can be done to sustain the recent declines in violent crimes committed by youth?

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### 1. The Impact of User-Oriented Design on Recycling 40-Foot Shipping Containers into Adaptable Living Spaces or “Container Apartments”

**Ernest Totimeh, Uriel Beltran, and Walied Althunai**  
*Faculty Advisor: Dr. Amit Arora*

Recycling containers is one way of conserving environment while at the same time ensuring that resources are not depleted. This research explores recycling 40-yard shipping containers into living spaces which can be used by students, young professionals or homeless people. Environmentally friendly housing practices continue towards the efficient use and recycling of energy. These containers will be made using recycled and sustainable materials for the inside including the furniture and insulation. The energy used in the living spaces will be generated through green energy practices. Modern and affordable solar panels will be used to produce electric energy for heating and lighting purpose. The purpose of this research is to develop a sustainable housing solution using recycled materials while at the same time optimally utilizing the available space. Furniture in these living spaces will be adaptable and foldable user-oriented designed furniture. Given the importance of using space efficiently, as well as facilitating a sustainable living space using renewable sources that would otherwise remain sitting idle, this research paper will address the following questions:

- What are the factors to consider in user-oriented design focusing on living spaces?
- How can user-oriented designed living spaces improve the housing experience?
- How can the current options of recycled containers be improved?

**Keywords:** *sustainable, living space, recycling, user-oriented design, affordable, furniture*

### 2. Green Roof Installation in Guayaquil, Ecuador: A Design Thinking Approach

**Paula Avellan**

*Faculty Advisor: Dr. Anshu Arora*

Consumer responses are pivotal for high-tech product innovativeness. Consumers’ expectations and reactions towards design and technical newness in high-tech innovations are essential to determine consumers’ purchase intentions and predict the success of certain products in the market. One such high-tech innovation is **green roof installation**. Green roofs contribute to energy savings and building efficiency due to their insulating capacity that reduces the need for air conditioning and heating. The high volume of plants in a green roof can represent an immedi-

ate solution to air pollution by improving air quality in the city and aid in the city’s resilience against flooding. Green roofs can help cities build resilience and mitigate the adverse impacts that climate change and global warming caused in urban environments. Green roofs also represent a locally based alternative to food production with a reduced travel-related carbon footprint that lowers greenhouse emissions. This research proposes to install green roofs in the author’s birth city – Guayaquil, Ecuador by analyzing the impacts of building resilience that green roofs have provided in the author’s current city of residence: Washington D.C., USA. The research examines green roof installation as a high-tech innovation coupled with design and technical newness. The research addresses the following questions:

1. What are green roofs and how are they installed?
2. How can green roof city-based installations be envisioned as high-tech innovations with high degrees of design and technical newness?
3. How does green roof installation in a developed city: Washington, D.C. provide guidance in installing green roofs in an emerging city: Guayaquil, Ecuador?

Design and technical newness can be utilized by companies to innovate in design and technology and improve brand and consumer attitudes. Our research focuses on a high-tech innovation through green roof installation across developed and emerging world cities and provide future directions and managerial implications.

**Keywords:** *high-tech innovation, green roof installation, design newness, technical newness, design thinking, developed and emerging world cities*

### 3. The Implementation of Power Generating Floor Tiles in Major Developing Cities

**Fahad Abdullah Aldamer, Ammar Ali Hamed Alkalbani, Yazeed Alshahrani, and Jerry Medley**

*Faculty Advisor: Dr. Nazha Gali*

The research discusses the useful aspects of the implementation of a sustainable energy source on street sidewalks, college, and school campuses and other public places where people are mainly walking. In this research, we focus on energy generating floor tiles, which were invented by Laurence Kemball-Cook and are a new environmentally friendly way of producing energy. The tiles transform the pressure created from our steps into electricity through a function that we discuss further in the paper. In many cases, the tiles are the best alternative sustainable energy source, because they transfer mechanical energy into electricity, instead of depending on photonic and thermal ener-

gy. Cities like Tokyo, Washington D.C and London have already installed those tiles and proved their success. The research presents the design of the floors, their functionality, and the overall cost of their implementation. The example that we used in the paper are Pavegen, and how they presented the idea and what does it take to spread it everywhere. In the research, we provide facts about energy usage in major cities of developed countries, as well as developing countries such as Riyadh- Saudi Arabia-, Dubai- United Arab Emirates-, and Kuwait, and what having these floors would add to the cities.

**Keywords:** *energy creating floors, energy floors, energy titles, sustainable floors*

#### 4. Smart Patch: Health Care Innovation in Wearable Electronics using Customer-Oriented Design

**Jianyi Gao, Elmer Hernandez**

*Faculty Advisor: Dr. Amit Arora*

This research focuses on hi-tech wearables based on consumer interests. Technology has become a major impact on our lives today, and hi-tech wearables is part of that group. Hi-Tech Wearables includes anything from smartwatches and robotic exoskeleton vests to implantable technology. There are many consumers that are interested in creating new hi-tech wearables based on their needs and interests. Based on studies, consumers are more likely to purchase products that they take part in developing. Also, some studies indicate a higher quality product when manufacturers focus on the raw idea component when designing products. The purpose of this research is to design a wearable device that may help reduce the number of heart related deaths. There are many people who are blinded from their body's alerts and signals for signs of illness or disease. When this device is put into use, they will be able to monitor their health problems proactively. Rather than finding out about a major health concern later, they will be able to receive health related information from the device which may potentially save their lives. This research paper addresses the following questions:

- Does including consumers in hi-tech wearable product development increase sales?
- What type of hi-tech wearables are in demand?
- Should manufacturers focus on the raw idea design to produce better quality products?

**Keywords:** *technology, consumer interests, product sales, developing hi-tech wearables, raw design, innovation*

#### 5. Design-Tech Synergy: A Neoteric Approach to Innovation

**Mayumi Fleming and Kyle J. Kelley**

*Faculty Advisor: Dr. Anshu Arora*

In this research, we conceptualize 'design-tech synergy' and introduce the concepts of design newness and innovation, as well as, technological newness and innovation. Additionally, we look at the impact of varying levels of design newness coupled with technical newness, and consumers' willingness to purchase new products across developed and emerging economies. We attempt to study how China (an emerging Asian economy) and Japan (a developed Asian economy) respond to these design and technological innovations differently given the distinct differences in their country of origin (COO). Research also shows that having a stronger, more differentiated raw-idea plays a critical role in innovation and market success. Our research focuses on the following questions:

- How can technology and design innovations be combined to create 'design-tech synergy' through which a new product is created to increase an organization's competitive advantage, positive brand attitudes, and consumers' willingness to buy?
- How do raw idea and design-tech synergy apply in different COO to create competitive advantage and increased product sales?

Biomimicry and raw idea can be utilized by companies to innovate new product creations in design and technology and improve brand and consumer attitudes. Our research focuses on an innovation idea based on design-tech synergy in music and light accessories' industry across developed and emerging economies.

**Keywords:** *design-tech synergy, technology innovation, design innovation, Biomimicry, raw idea, market outcomes, new product evaluations, COO*

#### 6. Campbak Backpack

**Dorothea Knigge, Gloria Davis, and Ashley Ruff**

*Faculty Advisor: Dr. Nazha Gali*

Innovation is frequently heralded as the driver of the "new economy". Its myriad claims have been substantial. Sustainability-driven innovation goes beyond designing sustainable products and packaging. The direction of this project aims for the improvement of camping products specifically aimed to outdoor tents not only for the purpose of camping but for those in need of immediate shelter outside of their homes and those facing unforeseen housing situations. CampBak introduces a backpack tent for the outdoorsman. Added features to cater to the needs of our consumer; CampBak backpack tent includes water filters, sustainable material that resists extreme weathering, a heated

base that lasts 12 hours for cold environments. Our goal for CampBak is to reach out to those who want more of a camping tent including features that are necessary when you don't have access to clean water. Inspired by elements of nature and easy inflatable setup and breakdown that folds into a backpack; the tent makes it all the easier and accessible. A simple but effective structure which has the potential to change so many lives across the world by providing some of the basic human rights to displaced people: a home, clean water system and comfort. Our methodology of CampBak is design and quality driven. The end goal is to bring to the market the most well-designed, and highest quality outdoor products ever created for the most serious users and the most serious climate conditions situations and even refugees who face unforeseen living conditions. We did not create a solar powered tent for one reason, based on natural disasters, if so, there is no daylight for some days here on earth, the tent will still be heat activated like a large hand warmer. The study examines the difference between similar sustainable tents versus CampBak tent that is simple, adjustable to the environment and fits the needs of a serious outdoorsman.

### **7. Innovation in Battery Power Management of iPhone** **Blaize Gillard, Chante Brailey, and Dolores Bivini Ayecaba**

*Faculty Advisor: Dr. Amit Arora*

This research primarily focuses on innovative ways to prevent cellphones running out of charge during usage. In order to explore this problem, this research surveys cellphone users to find out how often does a cellphone run out of battery when they travel to work or school for the day. In order to understand the importance of having a fully charged phone for the day, we examined the activities of when cell phones usually run out of charge on users when they are using them. Moreover, in order to understand why cellphones run out of charge, the research also focuses on how often people forget to charge their phones the night before they leave for the day, forget to carry with their chargers, how often people ask others for a charger, and also how often people look around for users who use the same type of charger they use. The purpose of this research is to propose an innovative solution to prevent cellphones running out of charge with a focus on Apple's iPhone. The research paper addresses the following questions:

- How often does cell phones run out of charge?
- Why is it important to have a fully charged phone for cellphone users?
- How can we prevent a cell phone from battery drainage?

**Keywords:** *cellphone dying, chargers, iPhone battery, prevention, airdrop*

### **8. Visionary Innovation and Design Thinking to Connect with Consumers**

**Dior N. Lewis, Franck Tchoukeu Vincent, and Alexis Taylor**

*Faculty Advisor: Dr. Anshu Arora and Dr. Amit Arora*

Visionary Innovation is the ability to create and articulate realistic goals. Raw Idea is defined as the original conception of an idea will create connectivity with consumers. When the connectivity is established, companies can incorporate design newness that will meet consumer needs. This is the power of 'design thinking' approach. This approach incorporates 3 Ds – DEFINE / understand the product users; DESIGN / provide elements to the product that combines consumer needs and vision; and DEVELOP / create the new product keeping the user in mind. Our research focuses on the following questions:

1. What is visionary innovation? How can visionary innovation and design thinking be combined to create revolutionary new products?
2. How do raw idea and consumer connectivity help in visionary innovation to create competitive advantage and increased product sales?

Design newness and raw idea can be utilized by companies to innovate and create new products in design and technology and improve brand and consumer attitudes. Our research focuses on an innovation idea based on visionary innovation in wearable electronics industry across developed and emerging economies.

**Keywords:** *visionary innovation, design thinking, raw idea, connectivity, market outcomes, consumer behavior*

### **9. Changing the Waters**

**Tyesha Brooks and Malik Thom**

*Faculty Advisor: Dr. Nazha Gali*

The Waste boat was created to introduce strong commitments for ocean clean up movement, yet at the equivalent time strengthened the challenges for present ocean governance in discussing aquatic waste contamination. The result of toxin pollution in the world's oceans has attracted progressing observable interest with proposes a worldwide consensus to discuss this matter. Humans have largely contributed to the world's seas as repositories for waste. Countless of the trash dumped into the oceans, such as plastic, stranded vessels, and fishing nets, account for 90%

of the trash in the oceans. Ocean waste has also accumulated from a hurricane, tsunamis, and other severe oceanic issues. Furthermore, plastic debris has been discovered worldwide in all marine habitats. Affecting millions of aquatic animals, including birds, turtles, whales, etc. suffer from extreme illnesses and deaths as a primary outcome of pollution. The destruction people have caused to the oceans reveal how uneducated our habits have been and represent a signal that we must start to pay attention to on a global perspective. The waste boat looks to make a difference in the oceans, and future generation lives. If humans neglect education and motivation to improve their behaviors to start keeping the waters clean also developing respect the oceans, humans, and animals who depend on the seas for survival will continue to suffer the consequences.

### 10. Wheelchair Design Innovation: Technological and Ergonomic aspects

**Milton Diaz, Kelvin Quinteno Herrera, and Reginald Cannon**

*Faculty Advisor: Dr. Amit Arora*

This research focuses on price and features of a wheelchair. Wheelchairs are essential to people who are unable to walk or use their limbs. Electric wheelchairs are a great benefit to disabled people, but the price of electric powered wheelchairs is exorbitantly high. Innovation has taken place in electric powered transportation industry, especially in cars and e-bikes, focusing on both price affordability and features. However, innovation in electric wheelchairs has focused mainly on adding new features while ignoring the price and basic functionality. There are not many people who can afford or willing to pay high price for electric wheelchairs. It may be that companies producing electric wheelchairs are taking advantage of the needs of people who could benefit from this product and, therefore, charge more than they should. On the other hand, it may be that the cost of production and labor are high, and these companies are forced to charge a higher price. This research examines the needs of wheelchair dependent people and suggests innovations to the wheelchair in order to reduce its price. For instance, in order to reduce the weight, it is vital to reduce the size of the battery while maintaining its performance. Also, it is important to create a detachable battery pack that will facilitate the folding and unfolding of the wheelchair. Additionally, the material used for the frame of the wheelchair could possibly be lighter, while still provide durability and safety. The research addresses the following key question:

How can companies reduce the price and change the design of the wheelchair?

How can we adopt features from electric bikes to implement design changes in electric wheelchairs to facilitate mobility of disabled people?

**Keywords:** *electric wheelchair, battery, production, labor, price, performance.*

### 11. To ‘Innovate’ through ‘Raw’ and ‘Radical’: How Raw Idea and Radical Innovation Creates Organizational Growth for Emerging Economies?

**Marcus Mottley, Jalia Johnson, and Isaiah B. Robinson**  
*Faculty Advisor: Dr. Anshu Arora and Dr. Nazha Gali*

Globalization has played a significant role in the advancements of technology throughout the ages. Globalization allows countries to share their resources, and even ideas with one another. This collaboration between nations gives everyone the same intellectual capabilities because of the availability of resources, making every market of goods and services extremely competitive. Globalized economies utilize both incremental and radical innovations. Incremental innovation is a progression of little enhancements or updates made to an organization’s current items, administration, procedures or techniques. Incremental innovations are normally centered around improving a current item’s improvement effectiveness, profitability and focused separation. Many companies utilize incremental innovation to help keep up or improve an item’s market position. In contrast, a radical innovation is one that significantly affects a market and is disruptive in nature with drastic improvements to products. Product design and raw idea play an important and integral part of new product development. Our research focuses on the following questions:

1. How do product design dimensions influence firm productivity in globalized world?
2. What role does raw idea play in product design and innovations globally?
3. Which (incremental versus radical) innovations work for companies in today’s global world? How do these innovations apply to electronics industry?

Global and collaborative innovations reduce risks and share profits making firms competitive in the innovation and new product development process. Our research focuses on an innovation idea based on radical innovations in wearable electronics industry across emerging economies.

**Keywords:** *raw idea, product design, incremental innovation, radical innovation, globalization, electronics industry, emerging economies*

### 12. Automotive Technology- A Race for Better Innovation

**Rosslyne Terry, Jocelyn Salamanca, and Taneeka Hughes**

*Faculty Advisor: Dr. Nazha Gali*

The auto industry has developed into a range of multiple companies and organizations that have come together over the years. The automotive industry has surpassed many innovations and is constantly growing. The purpose is to develop, manufacture, market and ultimately sell motor vehicles. This research paper will entail different aspects of automotive innovation as well as the group idea of a sustaining innovation. The research will discuss cameras and fingerprint freeze as part of the idea. The research paper will answer the following questions:

1. Does open innovation help companies succeed?
2. What obstacles do sustaining innovations face?
3. Why are the needs for better innovation?

**Keywords:** *automotive industry, automotive technology, sustaining innovation, open innovation.*

### 13. Innovative Heart Rate Monitor: Wearable to Hi-Tech Wearable Device

**Michael Shipp, Michelle Sims, and Christopher Iweriebor**

*Faculty Advisor: Dr. Amit Arora*

The purpose of this research is to propose a heart rate monitor with display and an alert system that may help reduce the rate of sudden deaths resulting from heart attack among athletes and heart patients. We specifically address the problem of relatively low life expectancy among these groups of people and focus on improving comfort and safety. Heart rate monitors are a useful tool for both new and experienced athletes during exercise. Measuring heart rates helps athletes to exercise at the right intensity. However, the issue we identified is that most heart rate monitors do not have a display, so one needs to connect to the screen of a smartwatch or a smartphone to visualize the heart rate. This is a big deficiency because if one forgets to wear the smart watch while exercising outdoors, but has the chest strap in place, it is useless for that moment. Wearing a watch while exercising can also be very distracting, discomforting, and inconvenient. For the few heart rate monitors with display, users must connect them with other devices to obtain accurate heart rate figures. Therefore, our innovation addresses the accuracy problem in heart rate readings from a few monitors with display. We are putting up this design for a heart rate monitor with display and an alert system, which will ensure an accurate

reading without any need to connect it with some other device.

**Keywords:** *heart rate monitor, life alert, safety.*

### 14. Let's Learn from Nature: Biomimicry and Raw Idea in Radical Product Design

**De'Nea M. Barton and Dajae T. Scott**

*Faculty Advisor: Dr. Anshu Arora*

A raw idea is the most critical part of a product in the innovation stage. Raw idea is defined as the opportunity as conceived at the beginning of the innovation effort in a specific organizational context. The three dimensions of product design are functionality, symbolism and aesthetics. Functional product design describes the process it takes to make sure a product functions the right way. Product symbolism gives a product symbolic features that people can relate to or get some emotional affect/connection with the product. Aesthetics is a study of how the mind and how our brains interpret something as being beautiful or ugly. With the knowledge of a raw idea and three dimensions of product design, our research focuses on radical innovation and biomimicry. Radical innovation is an invention that disrupts the industry and drastically changes/improves the existing product. Biomimicry uses certain forms of nature as a replica for the way they design a product to solve a certain problem. The research addresses the following questions.

- How does raw idea apply to consumer goods and developing economics?
- Aside from aesthetics, symbolism, and functionality what other dimensions of product design can be explored?
- How can new products be improved through biomimicry and radical innovations?

Our research introduces 'Medical Toilets' as our radical innovation for both developed and emerging economies with sustainable impact on planet and people globally.

**Keywords:** *symbolism, raw idea, radical innovation, product design, medical toilets, functionality, biomimicry, aesthetics*

### 15. The Goose: An Amphibious Transportation Solution for First Responders

**Simon Caraballo, Jada Foy, Sandra Okeley, and Thierno Ousmane**

*Faculty Advisor: Dr. Amit Arora*

This research paper focuses on how auto-bikes can be integrated in the everyday use by first responders to save lives.

The amphibious auto-bike capable of operating on both land and water has the potential to revolutionize transportation as related to emergency management where first responders are required to tackle emergency situations especially in water. The proposed innovative auto-bike will be made from environmentally friendly material and help during emergency situations. This innovation can be helpful for first responders during rescue operations in water bodies which allow them to circulate easily and efficiently in an environmentally friendly way leading to reduced greenhouse gases unlike those with internal combustion engines. This research paper addresses the following questions:

- How can this auto bike be accepted by first responders?
- What impact will the use auto bikes have in the emergency management sector?
- What are some other benefits this bike may bring to other parts of the world?

#### **16. The Innovative CEO: Leading Innovation from the Top through Raw Idea and User Involvement in Product Design**

**Yvette Olivarez and Maria D. Seals**

*Faculty Advisor: Dr. Anshu Arora*

The research investigates how a “raw idea” can become successful through user involvement in the innovation process, product design, and leadership from the CEO. The study demonstrates how product design is a source of competitive advantage for companies. The research addresses the following questions:

1. Will the CEOs be able to provide integrated information to the research and development for smart watches to have aesthetics, functionality, and symbolism?
2. What is the connection between quality of a “raw idea” and the end success of the innovation?
3. How can we improve innovation by leading/innovating from the top?

Raw idea can be utilized by companies to innovate new product design for better brand and consumer attitudes. Our research focuses on an innovation idea based on leadership-innovation synergy in smart watch industry across developed and emerging economies.

**Keywords:** *raw idea, product design, aesthetics, functionally, symbolism, new product development, user involvement, market outcomes*

#### **17. GPS Navigation System with Touchless Turn Signals**

**Hilburn Sparrow, Franshawn Hopkins, and Danillo Besera**

*Faculty Advisor: Dr. Amit Arora*

This research explores the possibility of improving driver safety by incorporating a Global Positioning System (GPS) navigation with a program that switches on the blinker when the vehicle is turning. According to research, not using turn signals and having an in-car navigation or navigation units causes distractions while driving resulting in almost 2 million accidents. One in every five accidents in the US can be blamed on a forgotten turn signal. The purpose of this paper is to improve the safety of the drivers and pedestrians by eliminating the step of manually switching your turn signal on and off. The growing use of technology in the car industry has ensured that almost every car comes installed with a GPS system installed or is already equipped with the technology to easily integrate a GPS device with the car. We propose integrating GPS Navigation Systems with Touchless Turn Signals, leading to reduced accidents and fatalities.

**Keywords:** *touchless turn signal, GPS, driver safety.*

#### **18. Building and Enhancing Access to “Green Furniture” for Furniture Manufacturers**

**Parys Black and Misgana Hasenu**

*Faculty Advisor: Dr. Amit Arora*

In a world where natural resources are dwindling and preservation of the environment is more important than ever, manufacturers all over the world are strategizing on how they can create sustainable and cost – friendly products for both, their consumers and their companies. Manufacturers faced with increasing cost of materials are challenged with either absorbing these rising costs or, pass them down the chain to the consumers and risk losing business. While everyone would agree that eco – friendly product initiatives are important to the world around us, the limited research on the benefits on business performance, requires manufacturers and companies to develop objectives and products without any evidence of its success. The furniture industry includes the design, manufacture, distribution, and sales of functional and decorative objects of household and outdoors equipment. This research will examine ways to cut down these costs by developing environmentally-friendly practices (EFP) within the operations management value chain. We will also take a closer look on what being done when it comes to baby furniture and ways to make it safer and worry free for the parents and caregivers. The questions that will be an-

swered in this paper are:

- How does organizational input of eco-friendly product design strategy influence consumer behavior?
- How does integration of sustainability efforts affect business performance?

**Keywords:** *environmentally-friendly practices (EFP), value chain*

### **19. Live or Die: Will “Eden” or “Zion” Save a Human by Sacrificing Self? Designing Challenges and Opportunities for Integrating Robot Ethics**

**Loucace Ampe and Barbara Payne**

*Faculty Advisor: Dr. Anshu Arora*

As artificial intelligence evolves, social and medical robotics is evolving as well. Robots are needed in the workforce and even more in the social environment. The growing capacity of robots to perceive, be cognitive, and perceptive to human behavior will render it necessary to ensure laws, and ethical rules and regulations governing medical robotics. In this article, we exhibit different types of ubiquitous reasoning for portraying the robotic transformation. In this research, we analyze the design of “Zion (male robot)” or “Eden (female robot)” --- an ethical robot companion for the visually impaired. “Zion / Eden” will be programmed to interact with the blind at all times. The research addresses the following objectives:

Given the disruptive nature of robotic revolution, we analyze medical robotics with its compelling benefits and inherent challenges and risks confronting the society.

We explore research in technology design and the principles of robot ethics.

Furthermore, we investigate the relationships between social and medical robotics with regard to social norms and ethical/legal regulations.

In this research, our approach is to utilize the four robo-ethical regulations and predict their outcomes. In these experimental conditions, we will be able to determine if an ethical and socially autonomous robot can obey or object to protect the blind to its own demise. Our robo-ethical predictions are a major contribution to the anthropomorphic research in social and medical robotics.

**Keywords:** *social robotics, medical robotics, robo-ethical regulations, cognitive intelligence, artificial intelligence, anthropomorphism*

### **20. How can DC Residents find Zone Parking via a Real-time Phone Application?**

**Chatan Rathod, James Clipper, Shannell Hibbert, and Joella Roberts**

*Faculty Advisor: Dr. Nazha Gali*

We suggest a real-life smart parking application where zone street parking data is collected from field sensor devices and sent to backend servers for processing real-time usage for the application. The point here is to make a parking application where residents of the District of Columbia can find their parking in their own zones/ward faster and frequently in real-time. The parking application will create and authenticate an automated algorithm by having the objective of detecting sensors with anomalous behavioral patterns, i.e., outliers. We analyze the data of real parking by getting simulation models for parking frequency. We find a simple method of algorithm of parking occupancy times and show their limitations. Therefore, we design a more efficient algorithm learning methods such as self-organizing maps like that of Car2GO. We expect to maximize on the data we collect from a real sensor distribution. The residents here will see the data from the automated algorithm the application provides through the sensor devices attached or installed onto the street lights, signs or uprooted as its own device.

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