

# **Products for Traders: An Investigation at the Intersection of Artifact and Information**

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## **Abstract**

This proposal addresses the conference theme “*Envisioning Design for the XXI Century*” with a focus on the challenges for the future of industrial design through discussion on the impacts of technology on the discipline. A goal for this paper is to explore general issues related to the influences of technology on industrial design through a specific discussion of a case study that investigates the design of products within a trading floor environment. This case study showcases the results of a collaborative effort between one Universities Industrial Design program and the Chicago Mercantile Exchange’s (CME) Center for Innovation (CFI). This year long design studio course involved the collaboration of a unique set of participants – a university-based Industrial Design program, graphic design students, a prominent local industry, prominent local design professionals as critics (Motorola designers), and computer science consultancy for technology consultation. This studio effort touches on several of the conference categories, specifically design innovation (design and problem solving, design conception) and design research (design and information technologies, contemporary design issues).

The research was performed during the Fall 2004 semester, which included gathering information on the history of trading artifacts, a demographic analysis of traders, current trading artifacts (what is used to trade with today), an analysis of work processes (differences between electronic and physical trading), and emerging technologies research. Research methods used included interviews, online searches, contextual inquiry, and photography. The Spring 2005 semester was spent designing and prototyping the products.

*keywords: design and problem solving, design conception, design and information technologies, and contemporary design issues*

## **1) Introduction**

### **The influence of interactive technologies on product design**

Interactive computing technologies have had much influence over the past several decades on the field of product design, influencing design methodologies and products themselves. This paper examines the influence of technology on products through examples of work that showcase this impact, following that is a specific discussion on a yearlong design project.

Interactive computing technologies provide us with the abilities for products and surfaces to: respond to their environments, sense and react to a user’s physical state, connect and communicate with one another, move information within an environment, and be customized to an individual users needs. This paper will begin by discussing these concepts within a larger context through examples of recent work within these arenas, and will then move within a specific context – the application of these

influences to this specific studio project. The specific example discussed is a senior level, undergraduate industrial design studio that examined the design of products for traders at the Chicago Mercantile Exchange (CME). During this project, the University of Illinois Chicago worked with the CME's Center for Innovation on the design of products for traders during the year 2015. This studio involved the participation of both industrial and graphic design students, professional designers as critics, a prominent local industry, and assistance with electronics prototyping. This project touches on connections to the conference theme "*Envisioning Design for the 21<sup>st</sup> Century*", due to the integration of emerging technologies, with additional ties to design research and design innovation.

### **Research objectives**

The beginning research question examined in this course was: "*How can products be designed to facilitate trading at the CME in the year 2015? These products should be intuitive to use and enable efficient exchange of information within this environment. How can existing means of trading be leveraged in order to ease the transition from physical to electronic trading?*" One of the primary challenges for the project was in predicting and negotiating the transition from physical trading (historically done through the use of hand signals and physical trading cards) to electronic trading (a more recently and increasingly utilized form of trading performed online). Research on emerging technologies (presented in Section 2 below) was performed in order to understand opportunities that exist for the products of tomorrow.

### **Description of primary results**

In examining design within this environment, interactive computing technologies were examined that could facilitate an environment of intuitive, efficient information exchange. Some capabilities they provide us with are the abilities for products and surfaces to: respond to their environments, sense and react to a user's physical state, connect/communicate with one another, move information within an environment, and be customized to an individual users needs. Technologies were researched that enable these capabilities, including items such as: sensor imbedded gloves for information input, a wearable computer jacket, monocle eyeglass for information display, projection technologies, and infrared data transfer. As a result of the research, the studio was divided into three groups and products were designed within the following categories -- wearable products, interactive workstations, and an interactive information display board. Scenarios and personas were created in order to illustrate the interactive capabilities of the products, and product prototypes were developed to facilitate understanding of the physical properties of the designs.

## **2) Interactive Computing Technologies As They Influence Product**

Computing technologies have had a great impact on products over the past several decades. This project looked at some ways that computing technology has influenced product. These influences will first be illustrated through examples, and then discussed in relation to the specific CME project.

### **Products can respond to their environments and to a users physical state**

There are many recent examples that illustrate a products increasing awareness of its environment, and a users needs within that environment. This studio project necessitates these types of interactions, and technologies were investigated that contain these capabilities.

One project found that illustrates a surfaces' responsiveness, is a project at The University of Virginia that looks at a sensor imbedded carpet that analyzes people's footsteps and foot patterns in order to detect warning signs of certain diseases. "Unlike monitors that require users to wear sensors, walk on special platforms, or be videotaped, this device sits on the floor unobtrusively." [1] It measures vibrations through imbedded sensors, and monitors a person's normal walking habits in order to detect any pertinent changes.

Another example of experimentation with responsive products is at Adidas through a running shoe concept. Adidas is in the process of developing a running shoe that responds to the individualized

human form – taking measurements and adjusting the performance of the shoe as a runner moves through space through an imbedded microchip in the sole and a sensor that measures the compression in the shoe with each step. This ensures a shoe that is tailored to an individual runner's strides.

Loop is a London-based studio that develops reactive surfaces and objects. Two projects of interest from this studio are *Blumen* and *Light Sleeper*. *Blumen* is a reactive wallpaper-like surface that reacts autonomously to the environment as botanical patterns blossom in response to programmed settings. [2] Another project that responds to an individual's needs is the *Light Sleeper*, a surface that responds to ambient light levels through an "illuminating, personalized alarm integrated into your bedding." [3]

### **Products can connect to information, and communicate with one another**

The Ambient Orb by Cambridge (Massachusetts)-based company, Ambient Devices, is a device that connects information to object(s). "Ambient's vision is to embed information representation in everyday objects: lights, pens, watches, walls, and wearables. With Ambient, the physical environment becomes an interface to digital information rendered as subtle changes in form, movement, sound, color or light." [4] Their first well-known product, the Ambient Orb, was designed to display information visually on a small, egg-shaped form – the colors of this object are programmed to change in response to weather, stock prices, or job opportunities in a certain city.

Another product that aims to provide connections between people through information imbedded within objects is the *ntag*, developed by ntag Interactive Corporation. It is a system built around an interactive name badge in the form of wearable objects (tags) that seek to improve networking between people through identifying the things people have in common and presenting that information to one another upon a first meeting. "When people meet, their nTAG's identify things they have in common and provide that information right at the beginning of the conversation." [5]

### **Moving information around: physical controls for digital information**

One component of the studio project that became important was the need to move information around within this environment. Technologies were investigated that allow people to do this in seamless, intuitive ways. One technology available for this purpose is glove input devices. While traditional input devices (mouse, keyboard) provide for two-dimensional input, these provide the ability to recognize and utilize human gesture(s) as an input device for digital information. "A glove is generally quite lightweight, with flexible sensors which accurately and repeatedly measure the position and movements of the fingers and wrist. Pressure sensors on the gloves palms measure occurring during object grasping. ... These sensors are bend sensitive and their resistance varies linearly with the bend. Sensors are extremely thin and flexible and provide an undetectable resistance to bending. Since the sensors exhibit low sensitivity to their positions over finger joint and to the joint radii of curvature, gloves provide high quality measurements over a wide range." [6]

The Crossing Project is another example of a project that explores computing based clothing and interactions with physical icons, with a goal of improving the hand-eye integration. "The Crossing Project presents alternative paradigms of information access, integrating the hand and the body in the act of computer-based learning and communication." [7] This project investigates alternative means of manipulating digital information, and "demonstrates futuristic forms of information access in which the technology surrenders to the human hand." [8]

Interaction Ivrea's Interactive Wallpaper – *Not So White Walls* – is a project that allows a person to interact with a digital surface. This surface is designed to allow you to read your e-mail, view digital photos, control house appliances, monitor the weather, and monitor changing barometer levels according to the humidity detected in the environment. Behind this surface is a grid of sensors, conductive materials, and resistors that allow the person to interact with the wallpaper directly through physical touch.

### **3) Research Within The Trading Environment**

The specific project this paper describes in relation to the research discussed above, is a studio collaboration between UIC's Industrial Design program and the CME's Center for Innovation (CFI) performed during the 2004-2005 academic year. This project performed research within an actual trading environment, with the project goal being to envision products for traders in the year 2015 based on today's work needs and on emerging technologies. The Fall 2004 semester was spent conducting the research for the project and in envisioning future scenarios, with the second semester (Spring 2005) spent on designing and prototyping the products.

#### **Research overview**

The research performed during the Fall 2004 semester included information gathering on the history of trading artifacts, a demographic analysis of traders, current trading artifacts (what is used to trade today), an analysis of work processes (differences between electronic and physical trading), and emerging technologies. Secondary research methods used included interviews, online searches, and contextual inquiry. The question examined was: *"How can products be designed to facilitate trading at the CME in the year 2015? These products should be intuitive to use, efficient, and facilitate information exchange. How can existing means of trading be leveraged in order to ease the transition from physical to electronic trading?"* One of the primary challenges for the project was in predicting, and negotiating, the transition from physical trading (called 'Open Outcry' and historically performed in a trading pit through the use of hand signals and trading cards) to electronic trading (a more recently and increasingly utilized form of trading performed online). It became clear that a major challenge (and need) for this project was in designing for this hybrid environment, and that our designs would have to satisfy the needs of two very diverse groups of people – both open outcry and electronic traders.

#### **Trading artifacts today**

In looking back at the development of trading artifacts, simple paper cards and hand signals were the first used methods of trading. These methods conveyed information necessary to trade such as buy and sell amounts, length of trading contract, month, and date of delivery. Within the trading pit today, hand signals and trading cards are still used in open-outcry trading to translate information. Hand signals enable fast communication over potentially long distances (as much as 30 or 40 yards), and are more practical than voice communication due to the noise level and number of people on the floor. Other objects used within this environment to facilitate trading are telephones, timers (to denote time of transaction), earphones, printers and screens (placed throughout the environment to show news and information about what is happening in the market). Increasing, handheld electronic devices (similar to a PDA) are used in order to trade. Process differences between the open outcry method, and the electronic method will be discussed below. The first electronic interfaces were unfamiliar to the pit traders, so the interfaces were designed to resemble trading cards.

#### **Trader demographics**

Next, methods of contextual inquiry were employed in order to assess the differences in the two types of traders (open-outcry vs. electronic). It was discovered that pit trading was a very male oriented arena with 95% of traders being male -- the majority being older, Caucasian, having varying education levels, varying backgrounds, were competitive, and height was somewhat important for success (taller traders are more visible in the pit). The electronic trader was also predominately male, but there was more diversity in terms of age and ethnicity. These traders were on average younger, but still mostly Caucasian, patient, more educated, analytical, and with strong computer aptitude.

#### **Work processes: differences between online and physical trading**

Trading processes were assessed in order to analyze differences between the open-outcry (physical) environment and electronic trading. The process in the pit can take anywhere from 30 seconds up to 3 minutes, and the process is as follows: 1) The trader calls the order desk at the exchange to place an order, 2) The person at the desk calls a runner to carry the order to the pit, 3) The runner takes the

order to the broker in the pit, and 4) The order is executed by the broker.

The electronic trading process is executed through *Globex*, the CME’s online trading interface. Trades made within this environment are done as a one-person operation – the person trading directly inputs and makes a trade instantly using the online interface. The order is instantly received and executed, and electronic trading is open 24 hours a day. The execution of an order takes mere seconds. An analysis was made of the differences between these two methods, in order to understand where some of the design opportunities lie. Are there transferable aspects that could be utilized in designing new technological products and systems for traders?

*Table 1: Advantages and Disadvantages of Trading Methods*

OPEN OUTCRY TRADING	ELECTRONIC TRADING
<b>Advantages</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Emotional</li> <li><input type="checkbox"/> Exciting Environment</li> <li><input type="checkbox"/> Supportive</li> <li><input type="checkbox"/> Competitive</li> </ul>	<b>Advantages</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Risk Management</li> <li><input type="checkbox"/> Cheaper for Firms</li> <li><input type="checkbox"/> Financial Safeguard</li> <li><input type="checkbox"/> 24 Hour</li> <li><input type="checkbox"/> Liquidity</li> <li><input type="checkbox"/> Transparency</li> </ul>
<b>Disadvantages</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Environmental Damage</li> <li><input type="checkbox"/> Discrimination</li> <li><input type="checkbox"/> Slow</li> <li><input type="checkbox"/> Transparency</li> </ul>	<b>Disadvantages</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> No Excitement</li> <li><input type="checkbox"/> No Emotion</li> <li><input type="checkbox"/> Potential for System Failure</li> </ul>

Open Outcry Trading has advantages over electronic trading that included: the emotional aspect of trading, the exciting physical floor environment, and the collaborative nature of the work environment. The project sought to capture these elements in the end product designs.

#### 4) From Research Into Designing – Trader Types, Personas, and Scenarios

In order to transition from the research phase of the project into the design phase of the project, it was necessary to develop a picture of what the future world of trading would look like since it is currently a time of rapid change. This was necessary in order to help the designers understand the needs of the traders, develop an understanding of what this environment would look like in ten years, and assess what types of products should be designed for this group of people. This was accomplished through the development of trader types (archetypal representations of the different types of traders, their use characteristics, and corresponding behaviors), personas (fictional people created based on the different trading types), and scenarios that illustrate personas behaviors in action.

##### Trader types

Three trader types were identified: the ‘CME’ trader, the ‘on-the-go’ trader, and the ‘trading firm’ trader. Each type was distilled into archetypal characteristics, which included information on work behaviors, needs, desires, daily routines, and personal characteristics. The following table summarizes the trading types:

*Table 2: Trader Types*

TRADER TYPE ONE: The CME Trading Floor Trader	TRADER TYPE TWO: The On-The-Go Trader	TRADER TYPE THREE: The Trading Firm Trader
<ul style="list-style-type: none"> <li><input type="checkbox"/> age range is 30-45</li> <li><input type="checkbox"/> slightly nostalgic for “the way it was”</li> <li><input type="checkbox"/> likes being on the trading floor</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> age range is 25-35</li> <li><input type="checkbox"/> this trader is addicted to trading, and needs constant access (24 hours a day 7 days a week) to the market</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> age range is 25 – 50</li> <li><input type="checkbox"/> makes trades based on their trading firms strategy</li> <li><input type="checkbox"/> rely on auto traders (ATS)</li> <li><input type="checkbox"/> work on a salary or a</li> </ul>

<ul style="list-style-type: none"> <li><input type="checkbox"/> likes the energy of being together</li> <li><input type="checkbox"/> is a specialized trader (specialize in a specific type of trading. i.e. eurodollars, equities, foreign exchange, commodities, interest rates...)</li> <li><input type="checkbox"/> a sense of community is important to this trader and working in a community/collaborative environment is important to them</li> <li><input type="checkbox"/> this person is most likely to have made the transition from floor trading (pit) to electronic trading, but everyone on the new trading floor is accustomed to, and familiar with, technology</li> <li><input type="checkbox"/> they work from 7-2 pm or 9-5 pm and leave their job "at the office"</li> <li><input type="checkbox"/> they believe there is a time for trading and a time for "life"</li> <li><input type="checkbox"/> when they leave work, they know that other traders for their company are working around the world in other offices or exchanges -- in Shanghai, Tokyo, London, etc.. they are part of the U.S. "trading shift"</li> <li><input type="checkbox"/> trading is not their life -- it is a way of earning a living</li> <li><input type="checkbox"/> the ability to multitask is important - this trader would trade while watching television to keep up with what is happening in the world</li> <li><input type="checkbox"/> don't use auto trading (ATS)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> trading is their life</li> <li><input type="checkbox"/> they buy trading rights from CME</li> <li><input type="checkbox"/> this trader sees trading as the way to feed his/her family, and as the way of paying the mortgage</li> <li><input type="checkbox"/> without constant access to trading, they freak out a little as they feel like they are losing money with each minute/second away from the market</li> <li><input type="checkbox"/> are always trying to "keep up with the jones' "</li> <li><input type="checkbox"/> this is a highly individualistic trader with a go-it-alone attitude</li> <li><input type="checkbox"/> trading is important even at the beach when on vacation, at a kid's sporting event, or on the train to/from work</li> <li><input type="checkbox"/> important design considerations for this trader type: mobility, configurability, scalability, flexibility, portability</li> <li><input type="checkbox"/> trading strategy is developed individually</li> <li><input type="checkbox"/> no use of auto traders (ATS)</li> <li><input type="checkbox"/> obsessed with the opportunity to make a trade</li> <li><input type="checkbox"/> thrive on the adrenaline that they get from trading</li> <li><input type="checkbox"/> are disadvantaged because of small screen space</li> <li><input type="checkbox"/> their profit is based on buy and sell prices</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> commission</li> <li><input type="checkbox"/> are specialized traders (specialize in eurodollars, equities, foreign exchange commodities, ...)</li> <li><input type="checkbox"/> this "middle-of-the-road-trader" lives in the office 10 to 12 hours a day.</li> <li><input type="checkbox"/> they see life as more integrated with work than trader on the future trading floor of CME, but not as integrated as the on-the-go trader</li> <li><input type="checkbox"/> mobility is fun, but not important</li> <li><input type="checkbox"/> needs 24 hour access to the office, but doesn't necessarily need to be in the office to make a trade</li> <li><input type="checkbox"/> personal mobile devices (cell phones, PDA's) can serve as intermediary devices in order to access the market -- if they look down at their mobile device and realize the need to make a certain trade, they can call in to the firm and ask someone to make the transaction for them</li> <li><input type="checkbox"/> wants market information when they want it, but don't need it all of the time</li> <li><input type="checkbox"/> personal networking with others is important, because information sharing is important</li> <li><input type="checkbox"/> their trading firm may have multiple offices around the world and they can place a call in to someone at the firm in order to make a trade</li> </ul>
<p><i>this trader works at the new trading floor of the future at CME</i></p>	<p><i>this trader works at CME's trading floor of the future and/or rents space from a trading firm</i></p>	<p><i>this trader works at a prop trading firm or trading arcade</i></p>

## Personas

Three personas were then developed for each trader type, and several scenarios were then developed based on each of these personas. A sample is included for each trader type:

*Table 3: Sample Personas and Scenarios*

<b>Mary (On-The-Go Trader)</b>	<b>Sandra (CME Trader)</b>	<b>Bob McCracken (Trading Firm)</b>
<p><i>Characteristics</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 28 years old</li> <li><input type="checkbox"/> newly out of school, mathematics major</li> <li><input type="checkbox"/> lives in the downtown Chicago area</li> <li><input type="checkbox"/> uses public transportation</li> <li><input type="checkbox"/> technology expert</li> <li><input type="checkbox"/> uses mobile trading device</li> <li><input type="checkbox"/> works at a Prop Firm</li> </ul>	<p><i>Characteristics</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 33 years old</li> <li><input type="checkbox"/> has been working at CME since she graduated from high school</li> <li><input type="checkbox"/> lives in the western Chicago suburbs with her husband and two kids</li> <li><input type="checkbox"/> enjoys time outside of work – hobbies include gardening and cooking</li> <li><input type="checkbox"/> is slightly intimidated by technology, but has become more comfortable with it over time</li> </ul>	<p><i>Characteristics</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 48 years old</li> <li><input type="checkbox"/> worked his way up to CEO of his trading firm, where he has worked for the past ten years</li> <li><input type="checkbox"/> graduated magna-cum-laude with a degree in statistics from Princeton University</li> <li><input type="checkbox"/> lives in Evanston with his wife and four kids</li> <li><input type="checkbox"/> works a steady work day of about 10 hours</li> <li><input type="checkbox"/> enjoys golfing and traveling to his country home in Wisconsin whenever he can get away</li> </ul>
<p><i>Daily Routine</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Wakes up at 4 a.m.</li> <li><input type="checkbox"/> Two hours every morning, Mary spends on reviewing the changes in the market.</li> <li><input type="checkbox"/> She turns on the T.V. – CNBC.</li> <li><input type="checkbox"/> She reads Wall Street Journal, USA Today, Financial Times, and other papers so she can get variety of perspectives.</li> <li><input type="checkbox"/> She leaves home at 5:45 a.m. to catch the 6 a.m. Blue line train and takes her trading devices with her.</li> <li><input type="checkbox"/> On the way to work, on the train, Mary checks her e-mail, and instant messages few of her colleagues.</li> <li><input type="checkbox"/> Mary has programmed her mobile trading device so it alerts her of possible changes in the market that will affect her trading.</li> <li><input type="checkbox"/> She gets to work at 6:45 a.m. She has her own workstation</li> </ul>	<p><i>Daily Routine</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sandra gets to work at 6:00 am. She scans her hand and grants her access to the trading floor.</li> <li><input type="checkbox"/> This security system will read her handprints in less than a second.</li> <li><input type="checkbox"/> She checks the seating chat to see who has arrived.</li> <li><input type="checkbox"/> She locates her team members on the seating chart, and goes to sit with them.</li> <li><input type="checkbox"/> She discusses with other team members face-to-face, and also through the communication system within the trading floor network.</li> <li><input type="checkbox"/> She checks the market and order status at the workstation. Other team members will report to her either in person or through the communication system.</li> </ul>	<p><i>Daily Routine -- Scenario 1</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bob arrives at the office around 10 am and goes directly to his computer to check the progress of his teams and his customer's contracts.</li> <li><input type="checkbox"/> He then logs on to his computer and checks the network for the Daily Profit Loss Reports/Open Interest Reports.</li> <li><input type="checkbox"/> Bob selects one teams progress such as the Foreign Exchange market, like EuroFX, FrancsFX, other currency exchange rates.</li> <li><input type="checkbox"/> He then has meetings with the team leaders to discuss the reports and make any adjustments that are necessary.</li> <li><input type="checkbox"/> Bob then stores the reports and finishes his updates.</li> </ul>

<p>and logs in, using her fingerprint as a password.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> At 7:00 she is ready to trade.</li> <li><input type="checkbox"/> Occasionally she communicates with her colleagues to discuss the market.</li> <li><input type="checkbox"/> She starts trading, using the Prop Firm's money, and her own strategies.</li> <li><input type="checkbox"/> On her lunch break at noon, she takes her mobile device with her to go to the nearest coffee shop.</li> <li><input type="checkbox"/> She goes back to the office after a 30 minute break and continues to trade.</li> <li><input type="checkbox"/> She has a little blue tooth device that alerts her by vibrating if there is an important change in the market.</li> <li><input type="checkbox"/> Mary's workday ends usually at 3 p.m., but today she has a meeting after work, which ends at 4 p.m.</li> <li><input type="checkbox"/> Mary takes the train back home.</li> <li><input type="checkbox"/> At home she trades some more.</li> <li><input type="checkbox"/> Mary enjoys going out with friends, shopping, and visiting her family in the suburbs. She carries her bluetooth alert system with her, so she can respond immediately to any change of the market.</li> <li><input type="checkbox"/> After all, her main goal is to make money -- as much as possible!</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> She monitors other team members to see how they are doing.</li> <li><input type="checkbox"/> She gives her professional advice to other team members.</li> <li><input type="checkbox"/> At 11:00, there is breaking news about a Mad Cow Disease.</li> <li><input type="checkbox"/> Sandra searches for more information online and contacts with the main company. They decide to sell all the cattle shares they have in hand.</li> <li><input type="checkbox"/> She quickly gives out order to other team members to sell their shares as soon as possible.</li> <li><input type="checkbox"/> Since an expected situation has occurred, Sandra doesn't get time to have her lunch. She continues to monitor the market statue and discuss with her company and team members.</li> <li><input type="checkbox"/> Sandra has to take care some of the customers' orders by buying and selling their shares.</li> <li><input type="checkbox"/> After a long, busy day of work, Sandra takes off after she gets everything settled.</li> <li><input type="checkbox"/> She checks out at the gate and gets ready to go home to make dinner for her family.</li> </ul>	<p><i>Daily Routine -- Scenario 2</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bob was on his way home and suddenly his PDA alerts him about price drop in the EuroFX market.</li> <li><input type="checkbox"/> He calls his team leader in EuroFX and asks what was the cause for the price change.</li> <li><input type="checkbox"/> Bob makes sure that his team leader has alerted any customers about the price change and suggests any trades that should take place.</li> <li><input type="checkbox"/> He gets confirmation and goes to sleep knowing that his trading firm is on track.</li> </ul>
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After these exercises, important product characteristics emerged that became important to encapsulate in the end products. These overarching characteristics include speed, efficiency, easy access to information, and intuitive use. Specific characteristics were developed for the individual projects.

### 5.0) Designing and Prototyping Products

During the second semester of the project, the class was divided into three groups and each group was assigned a particular product emphasis based on the scenarios presented at the end of the first semester. The products assigned were a wearable product, an interactive trading workstation, and an interactive information display board. It was necessary for each product to work interactively with the



others in order to design the most efficient trading environment. In order to facilitate the designing, each groups' initial task was in determining a *design brief*, *design criteria*, *aesthetic descriptors*, and *inspirational imagery*. After this, the groups moved into the ideation phase and begun sketching and presenting ideas to the client on a weekly basis. During the design phase many concepts were discussed in relation to trader needs, as well as the overall product system and the interrelationships between the three projects. The capabilities discussed above in section 2, were all utilized in some way in the final design concepts.

Final results of the class included: a series of images that show how the three projects relate to one another, charts that describe the relationships between the features / functionality / information / technologies of the projects, scenarios that illustrate how the objects are used together, and product prototypes that illustrate the form relationships amongst the three.

## 6.0) Conclusion

This project was challenging in many ways. Firstly, it was a challenge for these student-designers in that it introduced them to client-sponsored design. Prior to this experience, students worked on design projects of their own creation, and hence were not accountable to any 'true' end-user. This is an imperative experience for any student to have prior to entering the working world. During this project, student-designers were able to present and receive feedback regarding their ideas to a group of users targeted to use their products. Additionally, it pushed their presentation and communication skills within a client environment -- this was greatly beneficial in improving (and obtaining) the necessary design communication skills.

A second major challenge for this course was an incredibly complicated subject matter -- understanding the psychological underpinnings of a trading mind was incredibly difficult for everyone involved. It presented a tough challenge, but garnered interesting results. Thirdly, was in balancing client expectations with industrial design needs. This project dictated working at the intersection of tangible product and futurist, visionary thinking. While the client demanded innovative, future-forward thinking -- the industrial design aspect demanded that the results be grounded. Lastly, is in tackling the difficulty of designing interactive products. It was learned that designing products in the future (those influenced by computing technologies) will truly be a multi-disciplinary effort. In this class, an ideal outcome would involve participants from industrial design, graphic design, architecture, computer science, electrical engineering, mechanical engineering, psychology, and anthropology. This dictates new needs for the industrial designers of tomorrow. New skills are necessary in order to illustrate product interactions, and prototyping that showcases actual product interactive behaviors.

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