The Wearable Futures Hackathon: Futures thinking, speculative design and wearable technologies in the Global South

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Abstract

The Wearable Futures Hackathon was a 12-week long, (online/offline) interdisciplinary course developed for undergraduate students of an open university. The program focuses on wearable technology and culminates in an exhibition of the participants' creative prototypes. To the best of our knowledge, the course is pioneers artistic practice and exploration on speculative design and futures thinking through wearable technology within the national and regional context. In this pictorial essay, we elaborate on each of the weeks' activities and the results of the program.

Keywords

Wearable technology; speculative design; design politics; Global South; design education; art-science collaboration; tactical media for social good; futures thinking; open and distance learning; creative industries.

Introduction

How the future unfolds is shaped by how we currently imagine it might look. [1] Many of these visions are provided to us in elaborate detail by sources like Hollywood, as well as other pervasive platforms such as social media and digital games. Opportunities to actively contribute to the creation of these future images are scarce, particularly in resource-constrained settings like the Global South. To this extent, among new media and speculative technology practices, we see wearable technology design (and wearable technology design education) as being particularly well-suited to the context of the Global South. Not only due to its affordability compared to other engineering innovations but also because it produces tangible outputs and ideas that can be physically appreciated.

Wearable Futures Hackathon Activities

With this in mind, we developed the Wearable Futures Hackathon, a 12-week hybrid (online/offline) interdisciplinary learning experience that combines physical computing, speculative design, and futures thinking (https://url.upou.edu.ph/wfh). Portions of the course was co-created by a senior student of the Bachelor of Arts in Multimedia Studies (BAMS) program at University of the Philippines Open University. [2] The choice of wearable technology was to set parameters for their output, as with fashion and technology, wearables are cultural products that embody specific timelines on which they were created. Their design and function can be treated as cultural artifacts that reflect the desires, fantasies, and beliefs of an era. [3] It is an ideal platform to introduce the intersectionality of technology, design, long-term thinking, and media for social good. As a production course, we capitalized on wearable technologies' open culture aspect to expose students to the processes of constant reinvention and sharing of information. This echoes the way e-textile education was used to disseminate knowledge in art schools and universities to introduce interdisciplinarity. [4] By introducing a wearable hackathon in the context of an open university in a developing nation, we anticipate an alternative trajectory in broadening horizons and participation in the global discourse of futures thinking. In response to Susan Ryan's notion of the solipsistic tendencies of wearable technologies, [5] we position the Wearable Futures Hackathon as a demonstration of the nascent need to introduce futures thinking, and more art-science collaboration in the Global South to participate in building a sustainable future.

The course was designed to provide BAMS students with a foundational understanding of speculative design and futures thinking to broaden their perspective on the potential applications of their multimedia studies. To qualify, prerequisite courses in programming and UI/UX design were necessary to assess participants' competence and preparedness for the course. The program was designed to be hybrid in its structure, with a series of synchronous/asynchronous and online and online/offline workshops to accommodate the diverse schedules of the students. Face-to-face sessions were reserved for collaborative brainstorming and skill transfer activities. To equip students with theoretical foundations, a curated selection of readings and sources was also made available to them before delving into the subsequent weeks of the program. The prototyping aspect of the hackathon necessitated participants to assemble a prototyping toolkit centered on the micro:bit microprocessor, which was pivotal for their engagement

with the digital aspects of the project. In subsequent sections, we chronologically recount activities from the course before presenting the final outputs of the students.

Week 1: Imagining Futures

The course started with participants introducing themselves and their interests, personal challenges in the future, and their idea of clothing. Afterward, participants were prompted to articulate their concept of time and gauge their temporal perception. To follow through an introduction to the importance of futures thinking and its role in shaping the present landscape. In this preparatory phase, participants will engage with an image enhancer app, as a tool to envision and acquaint themselves with their future self by using the image as their online profile. As a comprehensive introduction, students were provided access to lectures about tangible interfaces, and embodied interaction. As an overview of speculative design, students were primed on the Futures Cone diagram [6] to contemplate on the plasticity of the future. Participants were introduced to the basics of micro:bit computers as groundwork for the following tutorials and practical applications. This holistic approach ensures that participants were well-prepared for their academic exploration of the course content. experience.

Week 2: Physical computing and critical fashion

In the second week of the course, students were assigned to photograph a wearable object that they would find fit for innovation through guided questions to stimulate critical thinking. Participants were also invited to participate in an online research talk by the fellows of the Emerging Futurist Residency about their projects on fashion, futurism, and activism, [6] providing them insights into the intersectionality of each domain. Moreover, another required online viewing delved into the subject of “Islandpunk”, a tropical derivative of speculative fiction, engaging with the geopolitical and attitudinal dimensions of equatorial island nations in the science fiction genre. The program component during this week was a prelude to the immersive workshop experience and an invitation to research the multifarious aspects of innovation, activism, and speculative narratives in the context of wearable technology. [7] Finally, students began a series of self-paced tutorials on the micro:bit microprocessor.

Week 3: Wearables in the Far Future: Humanity in Outer Space

To stimulate creativity, students pursued online treasure hunts for examples of wearable technology prototypes that they could use as reference. Additionally, students were provided with video resources about wearable technology, focusing specifically on the intricacies involved in the spacesuit’s design and production. In conjunction with the islandpunk conceptual framework, participants were encouraged to listen to a podcast episode that talks about the application of indigenous principles in interstellar voyages. [8][9] This endeavor aimed to ground students in the capability of applying cultural attitudes and perspectives in the distant future. [10] The concluding activity of the week was a workshop consisting of science fiction role-playing games created to foster a novel mode of cognitive and imaginative engagement, conducted by guest lecturers from the MetaFuturism Lab group (https://metafuturism.net). Within this workshop, participants embarked on explorations in imaginary worlds and engaged in speculative scenarios. The underlying rationale of this workshop was to disrupt conventional patterns of thinking, exposing them to the unfamiliar and the uncertain. The workshop is designed to promote inclusivity and democratic engagement to promote receptiveness and collaboration in problem-solving. [11] This is an introductory stage of the workshop, which will develop further in the succeeding weeks.

Week 4: Engaging with Deep Time

Week 4 activities delved into the concept of *deep time,* referring to geological time scales, as defined by geologist James Hutton, wherein time is conceived as having "no vestige of a beginning, no prospect of an end," surpassing any anthropocentric understanding by an unimaginably vast magnitude. [12] This served as a form of provocation on long-term thinking in developing their scenarios for a future wearable technology. Simultaneously, the students transitioned into a more tactile and experiential phase of their journey as they delved into another series of micro:bit tutorials. At this stage, breadboard-based prototyping and sensors were introduced as potential extensions of the micro:bit’s features.

Week 5: Speculative Imagination and Forecasting

Continuing the thematic exploration of deep time, participants are prompted to revisit their contributions to the MetaFuturism storyline. In this phase, students are guided to engage in speculative exercises that center on their lifetime and the broader national context. Done through the lens of the Philippines’ Department of Science and Technology’s (DOST) interdisciplinary and transdisciplinary forecasting and strategic planning project in the year 2050. [13] Part of the exercise involved identifying which of the 12 sectors of Philippine society they would like to include in their narratives and envision into utopic, dystopic, or heterotopic scenarios. These classifications provide the participants with a structured framework for narrowing down and articulating their spectrum of potential futures. Through these exercises, students are equipped to navigate the complexities of speculative design while being firmly grounded in their personal views and national context, teaching a deeper understanding of the interplay between society and technology.

Week 6-7: Putting it Together

During this intensive two-week section, students participated in rapid-fire convergent thinking exercises, building on the knowledge and insights they developed from their online treasure hunts. This stage of the program required face-to-face interactions, with increased utilization of the laboratory and its resources

to boost ideation and cross-pollination of ideas among participants. The overall objective of this phase is to test their conceptualizations with each other and with us as course facilitators in order to arrive at viable solutions for their final outputs. Participants pitched their ideas to the course facilitators for critical feedback and recommendations for project implementation. By the end of this stage, the participants were able to determine whether they wished to pursue their projects individually or collaboratively as a group.

Week 8: Presenting and Communicating Speculative Ideas

As the hackathon neared its completion, the last three activities focused more on the presentation and effective communication of their projects. To showcase the students' work to a wider audience, their prototypes were exhibited in a gallery space (Figures 1-19). This exhibition is the overarching platform that encapsulated the diverse speculative activities that transpired throughout the hackathon, contextualizing, and lending depth to the participants' creative endeavors. At this point, participants applied the knowledge and skills they have acquired from their studio production courses like scriptwriting, video production, and video editing to craft compelling and coherent storylines that integrated their artworks. The exhibit can be viewed online at https://framevr.io/galeria-sinag.

Outcomes and reflections

After the hackathon, students were offered the opportunity to compose a reflection paper on their experiences throughout the course. The results illuminate the course's impact on their development from both academic and personal perspectives.

In terms of leadership and innovation, one student reflected on their belief in contributing insights and experiences, recognizing their capacity to create something impactful for future generations. Another student, initially focused on data privacy, expanded their scope to encompass environmental and social awareness, thereby shaping their project direction.

Regarding technical skills, the accessibility of micro:bit and Tinkercad instilled confidence in handling electronics. One student said, "Electronics have always been a weakness of mine due to an irrational fear of explosion and electrocution. This activity not only helped dispel this fear but also sparked a natural curiosity. It was memorable to me because it marked the beginning of my increased engagement in the course. After this activity, I became curious about what else I could do and researched how other electronic components worked."

Activities such as the MetaFuturism Lab workshop underscored the significant impact of creativity and storytelling on students' psychological and social development. One student remarked, "The workshop made me realize I have capabilities that I never knew I had and interests that I never thought I would develop. It heightened my awareness of current issues and situations and prompted me to be mindful of the future." Students shifted from viewing prototypes solely as solutions to current issues to recognizing their potential impact on future scenarios, highlighting the importance of considering long-term consequences and sustainability. Another student shared their realization that design need not always be perfect: "It does not have to be something that can instantly be used today. I thought before that people only make prototype designs to solve the current issues we have today, but the activities made me rethink this notion as we encounter different worlds of possibilities which we used as the basis to create a significant prototype to address that possibility."

Conclusion

The design of the course applied in an open university created possibilities to include subjects like futures thinking, speculative design, and tangible technology. It also considers the importance of face-to-face interaction despite the online setup. Applied in the context of the Global South, the practice of speculative thinking gave students the chance to be empowered and confront the complexity and uncertainties of their reality and their future and come up with solutions. [14] It gave them the platform to address social issues in their own ways through wearable technology. The exhibition of the students' work magnified the intersectoral problems of the current society, inviting further discussion among the visitors to speculate and problematize future scenarios through their own disciplinal lens. Courses such as the Wearable Futures Hackathon enrich the global discourse in developing a sustainable future, empowering people by giving them a platform to actively participate in, and construct, their imagined futures.

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The Wearable Futures Exhibit

For the culmination of the hackathon, an exhibition of students' work alongside the works-in-progress by the fellows of the residency program was held initially in UPOU Oblation Hall and subsequently at the University of the Philippine Fine Arts Parola Gallery.

Figures 1-2 (from top to bottom). Photos from the second iteration of the Wearable Futures exhibit. Exegetic materials are exhibited alongside to contextualize future scenarios of each artwork.

HasMi

Faye Anjeli S. Lopez, Airiel Licca Depante, Joshua Albert C. Dema-ala, Myles Lorraine Tuason, Hannah Beraquit

Designed as an inconspicuous identity tag, HasMi was conceived to address the problem of data privacy anticipated in the year 2037. HasMi features an offline identification record database embedded in Near Field Communication (NFC) chips hidden in wearable accessories, with a decorative logo as an indicator of the placement of the chip. A reed switch activates a light embedded in the accessory, signaling to the wearer when information is shared to provide a sense of security. HasMi's accessory collection—which includes a choker and an armband—metaphorically represents and resists the government's grip on its citizens' information. This wearable tech could also be used, for instance, in the medical industry, as NFC chips can be used as a wearable database for the wearer's medical history that can be scanned in case of emergencies.

Figure 3: Different accessory design for HasMi.

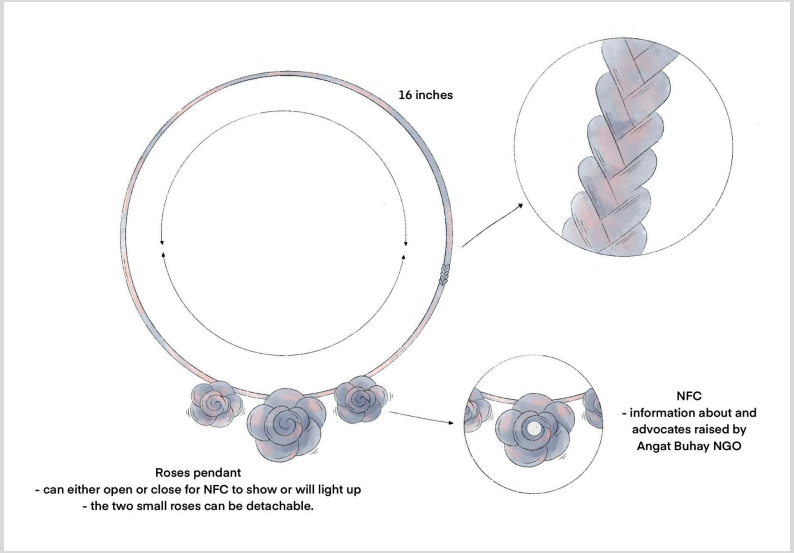


Figure 4: final design concept for the necklace configuration of HasMi.

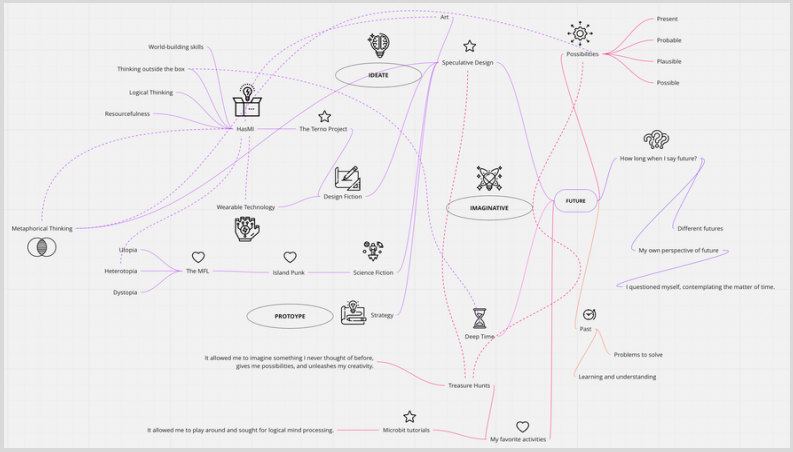


Figure 5: One of the student's concept map on how each of the activities in the hackathon help in the development of the artwork.

Figure 6: Exhibit display of HasMi.

NVro

Pauliana Jamie R. Nicolas, Patricia Martillano, Rajmyrr S. Suva, Arvic Angelo B. Cruz, Wrynz Dale Sumande

NVro takes its inspiration from “The Great Reset” video by the World Economic Forum and United Nations, [12] but envisions a dystopic future where environmental damage reaches its peak and people are forced to wear the NVro watch to measure their carbon footprint emission and reduction, these credits are then converted into a “carbon score”, an imagined currency like that of China’s social credit system. However, the technology is still susceptible to hacking which in turn leads to the enslavement of the vulnerable sectors of the population. The title is a play on the words “environment” and “envy”.

Figure 7: Exhibition display of the NVro watch along with its components.

Figure 8: Working prototype with the NVro watch that is connected to your smart phone for tracking.

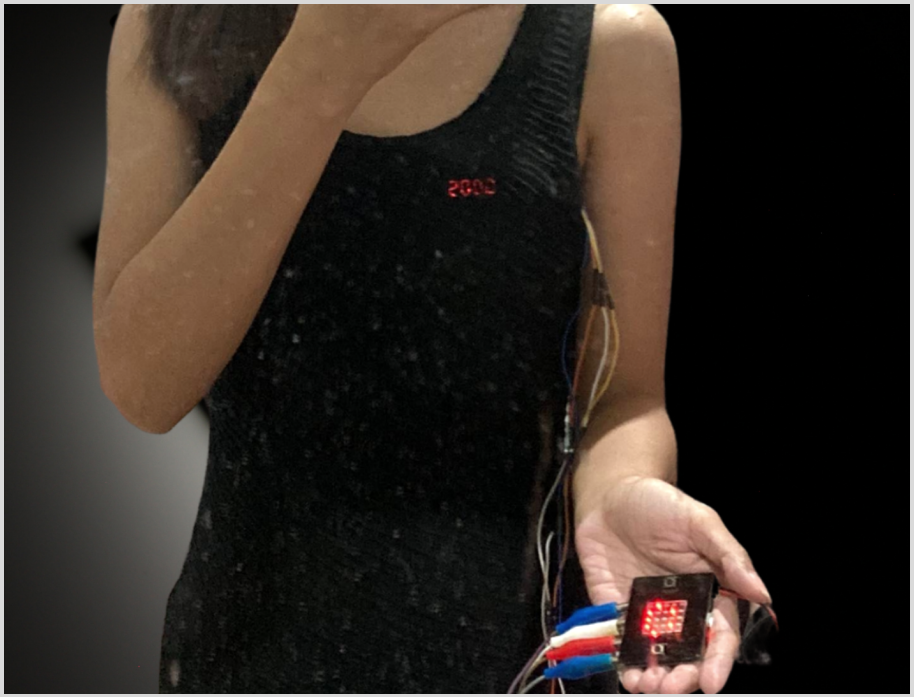
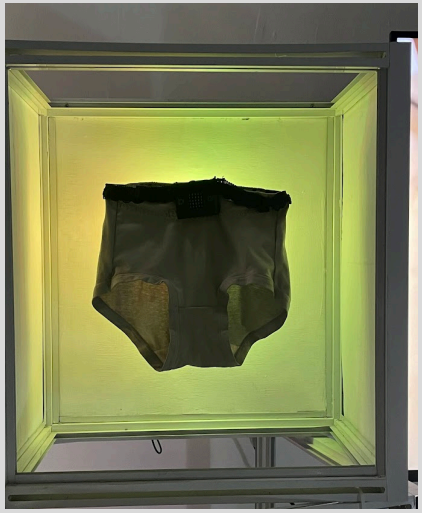


Figure 9: Early design concept for NVro that includes a Carbon Score display on the wearer’s shirt.

KA-KAMPANTE

Vernice Bethel C. Gica, Rel Daryle Dane R. Valle, Laryze Lozano, Michelle Lado

KA-KAMPANTE is a wearable technology that alludes to the medieval chastity belt but with a contemporary, feminist take. The name is a portmanteau of the different aspects of the work, “KA-” a prefix commonly used in the Filipino language to mean companionship, “KAMPANTE” also means complacecy or comfort, and “PANTE” refers to panties. KA-KAMPANTE is an anti-rape undergarment that overturns the concept of power by granting the wearer comfort and ownership of their sexuality, while promoting community safety and citizen security. Using stretch sensors and a microcontroller attached to the underwear garter or belt, forced removal of the garment triggers an alarm and notify the person’s emergency contact, or anyone in the vicinity wearing the same undergarment, Additional functions that could potentially be incorporated in future iterations include GPS location and fingerprint scanning.



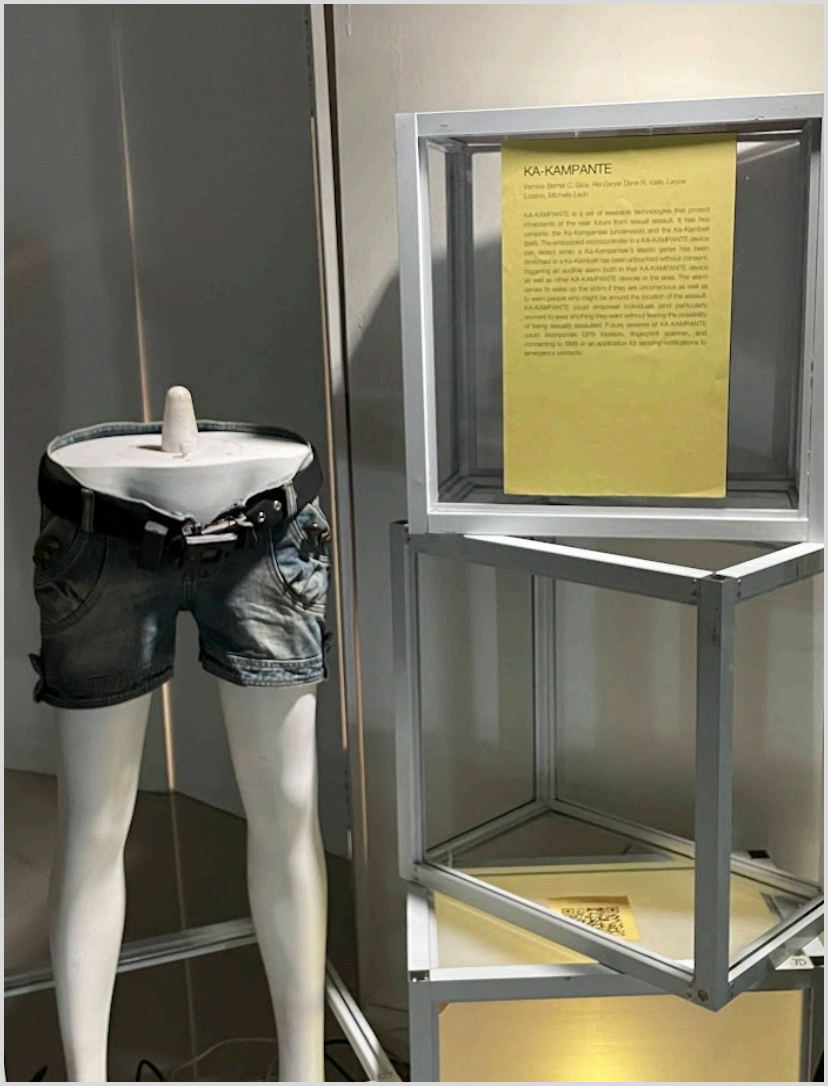
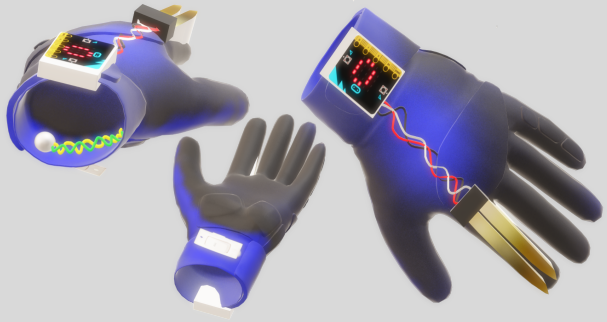


Figure 10-12: (Clockwise from top left). KA-KAMPANTE prototype and its reiteration KA-KAMBELT. Exhibit display with mannequin

The Index

Sapphire Marilag M. Dulorzo

The wearable device in concept is designed to detect and measure soil composition, with the technology embedded in the gloves for grasping the soil. The working prototype includes an embedded microcontroller and soil moisture sensor mounted on the index finger area of the gloves. The main objective of this project is the adoption of technology in farming practices.



(Counterclockwise from upper left)
Figure 13. Initial project proposal for sensing soil moisture and alkalinity.
Figure 14. 3D model of the working prototype for visual demonstration.
Figure 15. Exhibit display of the wearable tech including explanatory materials for context.

Exergen

Marciano C. Virola III

Preempting a potential future that normalizes accessibility of VR technologies, increased sedentary lifestyles, and increasing demands for sustainable energy, Exergen offers a wearable exercise device that harnesses the electricity from the wearer's motion, wherever they are. Exergen to reduce textile and electronic waste, it uses materials like old clothes and electronics commonly found in junk shops.

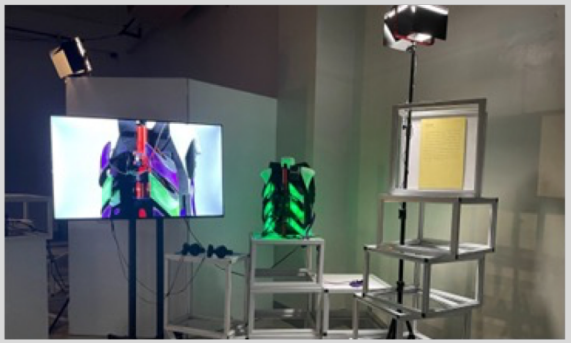


Figure 16: (Bottom). Early prototype for exercise generator using pneumatic sacs. Figure 17: (Middle). Stills from video demonstration. Figure 18: (Upper right). Exhibit display of the work including the audio-visual description. Figure 19:(lower right). Exhibit detail.