The Internet of Things User Interface | Navigating Physical and Virtual Information Spaces

Nhan Bui

Follow this and additional works at: https://surface.syr.edu/architecture_theses

Part of the Architectural Technology Commons, Cultural Resource Management and Policy Analysis Commons, and the Other Architecture Commons

Recommended Citation
A HACTIVIST REPRESENTATION

IoT + INFOSPACE + DIAGRAM
Hacking takes in the form of playful exploration through modifying and blending against conventional forces to achieve a new outcome.

"Operating at a low level, using existing infrastructure and power of a system to tinker, twist and modulate it after their own will. Building on the existing system with local patches and modifications. Adding small programs to the toolbox and presenting them with a journey on the same stream. Bending the flow of power, but keeping the current on." 2

Abstract Hacktivism

The adoption of concepts and mechanisms enacted in actual computers and hacking culture in non-computer contexts resulting in new forms of viewing politics, activism, and critique are emerging—even in social settings far removed from actual computer networks. 1

2. Busch, Otto von, and Karl Palmås. P. 52
INFOSPACE

WITHIN THIS SPACE EVERYTHING IN OUR ENVIRONMENT CAN BE SEEN AS INFORMATION OR CONTAINS INFORMATION THAT CAN BE EXTRACTED. INFORMATION IS THE FUNDAMENTAL ELEMENT. THROUGH THIS UNIFIED LANGUAGE, EVERYTHING REVEALED IS - AND DECODED AS - POLITICAL, BOTH PHYSICAL AND VIRTUAL INFOSPACE ARE SEEN AND UNDERSTOOD TOGETHER AS A CONTINUUM OF INFORMATION FLOW.

PHYSICAL INFOSPACE

THE MATERIALIZED ENVIRONMENT OF BUILDINGS AND OBJECTS.

VIRTUAL INFOSPACE

THE IMMATERIALIZED ENVIRONMENT OF WEBPAGES AND HYPERLINKS.
IoT

Any physical object embedded with electronic sensors allowing for information about the object to be uploaded online and allowing the objects to collect and exchange data.
INTERACTION SPACE

This describes the input actions of a user that change the computer's output. For example, clicking on a link causes a webpage to change its content; typing in a search query will cause a list of web pages to appear in Google, etc. Different types of interaction are mapped onto different types of screen space so that they reinforce each other.3

SCREEN SPACE

Constrained by the number of available pixels and the visual language used to display information. It can include web pages, a desktop GUI, a complex graph-based visualization or a 3D world, and each type of representation is constrained by metaphors and their visual rhetoric.4

SEMANTIC SPACE

Derived from the work of Kaplan and Moulthrop and defined as the structure of information held with a computer. It consists of information objects and their relationships to one another described through, for example, hypertext links or database fields. It is a tool for analysis: any information retrieval system is effectively a series of translations from raw data to ordered data, where some form of filtering has taken place to reveal structure, sometimes in the view of visualizing the results in the form of a diagram or to support the process of search and retrieval in complex information space.5
RELATIVE SPACE

Defined by information objects themselves and their relationships to one another independent of the spaces in which they are held. It is a natural occurrence in everyday experience...These relative relationships then acquire meaning as was shown in part one, by our conception of information objects in relationship to one another through metaphor.

A complex field that overlaps various paradigms of knowledge and enquiry that have resulted in diverse definitions of the diagram and consequently very different conceptualizations of its properties, function and use. These differences are also apparent in the way diagrams are described and valued in relation to architecture and spatial design and with respect to questions of validity, truth status, their ontological standing as both process and objects, and as mental and material phenomena.
CONTAINMENT

A conceptualization of how an information object can exist in a single instance or in more than one container simultaneously where one container is held within another in a hierarchical structure. Containment is equivalent to categories.8

CLOSENESS

The notion of closeness implies a geometric limitation placed on objects that have measurable distances between them. It is equivalent to similarity.8

CONNECTIVITY

Multidimensionality, in terms of connectivity, is a product of the topological restrictions that govern how places can be found to be adjacent to one another in a 2D plane. It is equivalent to meaningful relationships.8
**Space Syntax**

A diagrammatic method conceived and developed by architects Bill Hillier and Julienne Hanson in the 1970s as a way to analyze spatial structure and control of individual buildings and urban environments.9

**Gamma Graph**

A diagram that reveals spatial structure and control. It is used to analyze building interiors. Every interior of a cell (room) can be conceptualized as a point and represented as a circle, with its relations to permeability (entrance) represented by lines linking it to others.10
A diagram that shows user behavior in interacting with websites while revealing its spatial structure and control. The user starting from a main page and navigating deeper into the site before clicking on the back button repeatedly to return to the start point before embarking on another path. Such patterns represent coherent spatial structures where each node could constitute a place within a planar topological geometry.
ABSTRACT

HACKING CULTURE

APPLYING HACKING

LOSING THE BALLAST OF MATERIALITY

RE-EMERGENCE OF MATERIALITY

IoT

DIAGRAM

THE HISTORY OF DIAGRAMS

CONCEPTS

RELATIVE SPACE

TEST SITE 1

TEST SITE 2

INFOSPACE

INTERACTION SPACE

SCREEN SPACE

SEMANATIC SPACE

SPACE SYNTAX
IT IS PROJECTED THAT THE BOUNDARY BETWEEN OUR PHYSICAL AND VIRTUAL ENVIRONMENTS WILL BE FURTHER BLURRED THROUGH THE EMERGENCE OF THE INTERNET OF THINGS (IoT). IoT IS A NETWORK OF physical objects embedded with electronics, software, sensors, and network connectivity that enables these objects to collect and exchange information on the internet. The most prevalent example of IoT today is your mobile phone. The mobile phone is an electronic device with software that tracks your location via GPS and your preferences based on your interactions on the internet. The collecting and exchanging of information in today’s centralized internet infrastructure is controlled by a few powerful political and corporate institutions who have influence and ownership over the physical infrastructure of the internet (fiber optic cables, submarine cable stations, data centers, and etc.) and over how one navigates it.

This thesis is building upon the hacktivist mentality of information accessibility as explored in Abstract Hacktivism: The Making of a Hacker Culture by Otto Von Busch & Karl Palmas. Hacktivism is fundamentally grounded on the belief that information should be free and accessible to everyone. Thus, this thesis looks closely at the politically contested and censored environment of Vietnam through the introduction of a hackerspace, a hub for technological innovation, in Hanoi as a seed to transforming the physical and virtual landscape of Vietnam.

Through the method of drawing, this thesis explores the global, national and local scale of the physical infrastructure of the internet. It uses concepts from Martyn Dade-Robertson’s work, The Architecture of Information: Architecture, Interaction Design and the Patterning of Digital Information, as a way to describe our interactions with the internet and its emergence into the physical environment.

The thesis explores through drawing a way of representing and synthesizing both the virtual and physical infospace world. Through the inspiration of space syntax by Hillier and Hanson, the thesis attempts to visualize and reveal through diagramming/drawing the spatial structure and control that co-exist both in virtual and physical infospace. The drawing unifies both virtual and physical infospace through a single common language of space syntax. Through this unified language (the drawing) of space syntax, everything revealed is and decoded as political as both physical and virtual infospace are seen and understood together as a continuum of information flow.

Abstract
HACKER CULTURE


HACKERS OF THE 1950-60s AND 90s.

HACKERS OF THE 1950S AND 60S, KNOWN AS YIPPS, HAD ROOTS IN A LEFTIST POLITICAL AGENDA THAT GREW OUT OF THE LATE 1960S COUNTERCULTURE. THIS HACKERS WERE ALSO HACKERS OF ARPANET AT MIT IN CHARGE OF CREATING MILITARY APPLICATION FOR COMPUTERS AND NETWORK. HACKERS AT MAJOR UNIVERSITIES WERE A SIGNIFICANT PORTION OF THE TECHNOLOGICAL SIDE OF THE MILITARY-INDUSTRIAL COMPLEX. HACKERS OF THE 1960s AND 70s COULD AVOID THE OBVIOUS CONTRADICTION THEIR ANTI AUTHORITARIAN MINDSET AND THE FACT THAT THEY WERE DESIGNING FOR WERE NOT RESPECT OF HACKER ETHIC BECAUSE THEY WERE ABLE TO CREATE THE ILLUSION THAT THEY WERE IN CONTROL DUE THE FACT THAT THEY WERE PRODUCING THE VAST MAJORITY OF TECHNOLOGY. THESE HACKERS ARE MAINLY COLLEGE EDUCATED FOLKS. BECAUSE THEY ARE PART OF AN INSTITUTION AND ACCESS TO THE TECHNOLOGY WAS ONLY WITHIN SCHOOL SETTING, HACKERS THEN WERE LESS LIKELY TO CARRY OUT A MORE AGGRESSIVE OPPOSITION TO THE SYSTEMS THEY WERE IN. THESE OLD SCHOOL HACKER WOULD SOON BE CRITICIZED BY HACKERS OF THE 90s FOR MOVING OUT TO SILICON VALLEY TO START INDUSTRIES THAT ACTED MORE AS CORPORATIONS AND ORGANIZATION.

HACKERS OF THE 1990s

HACKERS OF THE 1990s, KNOWN AS CYBERPUNKS, EXIST IN A MORE COMPLICATE AND MULTICULTURAL WORLD. COMPUTERS ARE BEING USED TO DESTROY FREEDOM AND AUTONOMY AND CONTROL OVER COMPUTERS IS AN ACT OF SELF DEFENSE NOT JUST POWER. HACKERS OF TODAY JUSTIFY THEIR ACTIONS THROUGH CLAIMING THAT 60S HACKERS WERE THE KEEPERS OF SECRET WHO SOLD OUT FOR THE CORPORATE WORD. THESE HACKERS CONSIST OF WHITE SUBURBAN BOYS WHO HAVE THEIR OWN PCS AND ARE CHALLENGING AUTHORITY. UNLIKE 60S HACKERS, EXPLORING IS CONSIDERED HARMFUL FOR HACKERS TODAY BECAUSE EXPLORING SEEMED HARMLESS DUE TO THE FACT THAT THE CULTURE OF SECRECY DID NOT TAKE FULL EFFECT FOR THE 60S HACKERS. [HACKER CULTURE, DOUGLAS THOMAS]
HACKER SUBCULTURES

COMPUTER SECURITY HACKERS - SOMEONE WHO FOCUSES ON SECURITY MECHANISMS OF COMPUTER AND NETWORK SYSTEMS. THEY SEE THEIR AIM IN CORRECTING SECURITY PROBLEMS. THEY OPERATE UNDER A CODE, WHICH ACKNOWLEDGES THAT BREAKING INTO OTHER PEOPLE’S COMPUTERS IS BAD, BUT THAT DISCOVERING AND EXPLOITING SECURITY MECHANISMS AND BREAKING INTO COMPUTERS IS STILL AN INTERESTING ACTIVITY THAT CAN BE DONE ETHICALLY AND LEGALLY.

PROGRAMMERS HACKERS - SOMEONE WHO FOLLOWS A SPIRIT OF PLAYFUL CLEVERNESS AND LOVES PROGRAMMING. FOUNDED ON AN ACADEMIC MOVEMENT UNRELATED TO COMPUTER SECURITY AND ASSOCIATED WITH FREE SOFTWARE AND OPEN SOURCE. BASED ON THE ETHIC THAT WRITING SOFTWARE AND SHARING THE RESULT ON A VOLUNTARY BASIS IS A GOOD IDEA, AND THAT INFORMATION SHOULD BE FREE.

HOME COMPUTER HACKERS - A COMPUTER HOBBYST WHO PUSHES THE LIMITS OF SOFTWARE OR HARDWARE. BEGAN WITH THE HOBBYIST HOME COMPUTING OF THE LATE 1970s THROUGH THE AVAILABILITY OF MITS ALTAIR. THEY ARE RootED IN AMATEUR RADIO AND FOCUS ON COMMERCIAL COMPUTER AND VIDEO GAMES, SOFTWARE CRACKING AND COMPUTER PROGRAMMING.

HACKER SUBGROUPS

WHITE HAT - SOMEONE WHO BREAKS SECURITY FOR NON-MALICIOUS REASONS, FOR INSTANCE TESTING THEIR OWN SECURITY SYSTEM. THIS CLASSIFICATION ALSO INCLUDES INDIVIDUALS WHO PERFORM PENETRATION TESTS AND VULNERABILITY ASSESSMENTS WITHIN A CONTRACTUAL AGREEMENT.

BLACK HAT - SOMEONE WHO VIOLATES COMPUTER SECURITY FOR LITTLE REASON BEYOND MALICIOUSNESS OR FOR PERSONAL GAIN. BLACK HAT HACKERS BREAK INTO SECURE NETWORKS TO DESTROY DATA OR MAKE THE NETWORK UNUSABLE FOR THOSE WHO ARE AUTHORIZED TO USE THE NETWORK.

A GREY HAT - A COMBINATION OF A BLACK HAT AND A WHITE HAT HACKER. THEY MAY SURF THE INTERNET AND HACK INTO A COMPUTER SYSTEM FOR THE SOLE PURPOSE OF NOTIFYING THE ADMINISTRATOR THAT THEIR SYSTEM HAS BEEN HACKED, FOR EXAMPLE. THEN THEY MAY OFFER TO REPAIR THEIR SYSTEM FOR A SMALL FEE.

SCRIPT KIDDIE - IS A NON-EXPERT WHO BREAKS INTO COMPUTER SYSTEMS BY USING PRE-PACKAGED AUTOMATED TOOLS WRITTEN BY OTHERS, USUALLY WITH LITTLE UNDERSTANDING OF THE UNDERLYING CONCEPT.

NEOPHYTE (N00B OR NEWBIE) - IS SOMEONE WHO IS NEW TO HACKING OR PHREAKING AND HAS ALMOST NO KNOWLEDGE OR EXPERIENCE OF THE WORKINGS OF TECHNOLOGY, AND HACKING.

BLUE HAT - SOMEONE OUTSIDE COMPUTER SECURITY CONSULTING FIRMS WHO IS USED TO BUG TEST A SYSTEM PRIOR TO ITS LAUNCH, LOOKING FOR EXPLOITS SO THEY CAN BE CLOSED.

HACKTIVIST - WHO UTILIZES TECHNOLOGY TO ANNOUNCE A SOCIAL, IDEOLOGICAL, RELIGIOUS, OR POLITICAL MESSAGE.

CIVIL - PROGRAMMERS, DESIGNERS, DATA SCIENTISTS, GOOD COMMUNICATORS, CIVIC ORGANIZERS, ENTREPRENEURS, GOVERNMENT EMPLOYEES AND ANYONE WILLING TO GET HIS OR HER HANDS DIRTY SOLVING PROBLEMS. SOME CIVIC HACKERS ARE EMPLOYED BY NONPROFITS, SUCH AS CODE FOR AMERICA.

2. Busch, Otto von, and Karl Palmås. P. 52
ABSTRACT HACTIVISM

THESE THESIS ATTEMPTS TO MATERIALIZE AND BRING ATTENTION TO THE INVISIBLE FORCES OF THE INTERNET ON THE POLITICAL, ECONOMICAL AND SOCIAL SPACES THAT ACTIVATE AND DIRECT THE DIRECTION OF ARCHITECTURE IN THE CONTEMPORARY WORLD THROUGH THE DIAGRAM. IT ATTEMPTS TO EMBRACE A COMPUTER NETWORK-LIKE CONCEPTUAL MODEL OR MEDIUM, AND ARGUES THAT THIS MORE CLOSERLY MODELS HOW THE WORLD CURRENTLY OPERATES. WITHIN THIS CONCEPTUAL MODEL, THIS THESIS WILL EXPLORE HACKING CULTURE, SPECIFICALLY IN THE TERMS OF WHAT OTTO VON BUSCH AND KARL PALMAS CALL "ABSTRACT HACKTIVISM", AS A MEDIUM OR MODEL IN WHICH ARCHITECTS CAN OPERATE. BY IMPLEMENTING HACKING AS A WAY OF THOUGHT AND A SET OF OPERATIONS TO BE MORE PROACTIVE IN THE POLITICAL, ECONOMIC AND SOCIAL SPHERES.

WHAT IS HACTIVISM

HACTIVISM HAS BEEN ASSOCIATED WITH THE ONLINE STRATEGIES AND TACTICS OF ACTIVISTS THAT MORE OR LESS FOLLOW THE AUTONOMOUS ANARCHIST TRADITION - SQUATTERS, PHREAKS, SCAMMERS, CRACKERS AND CULTURAL JAMMERS WHO ENGAGED IN ANTI-GLOBALISATION, DIRECT ACTION AND RESISTANCE. THE TERM ABSTRACT HACKTIVISM WILL NOT DISCUSS ABOUT JAMMING AND RESISTANCE NOR ABOUT ONLINE ACTIVITY. HACKTIVISM IN THE ABSTRACT SENSE WHERE THE ABSTRACT MECHANISMS ENACTED IN ACTUAL COMPUTERS ARE ADOPTED ELSEWHERE, IN NON-COMPUTER CONTEXTS. THIS IMPLIES THAT NEW FORMS OF VIEWING POLITICS, ACTIVISM, AND CRITIQUE IS EMERGING (IT IS NOT ABOUT THE POLITICS OF ACTUAL COMPUTERS, OR THE USE OF COMPUTERS IN POLITICS).

HACKTIVISM IS MORE SUITABLE TO DESCRIBE THE CONCRETE ACTIONS OF ACTUAL PRACTITIONERS IN SOCIETY. MANY OF TODAY'S MOST INTERESTING ACTIVISTS, ARTIST AND DESIGNERS ARE CURRENTLY ENGAGING CONSTRUCTIVE ACTIVITIES THAT FIT WELL WITH THE ORIGINAL ETHIC OF THE EARLY HACKER. THE NEW MEANING OF HACKTIVISM IS BETTER IN LINE WITH NEW STRAINS OF THOUGHT IN CONTEMPORARY CRITIQUE. THE GOAL IS NOT TO BLOW APART OPPRESSIVE STRUCTURES (JAMMING, DETOURNEMENT AND DECONSTRUCTION) BUT INSTEAD THE CHALLENGE FOR ACTIVIST, ARTIST AND DESIGNERS LIES IN HOW TO CREATE WELL-FUNCTIONING SELF-ORGANIZED STRUCTURES (SELF-CONSISTENT AGGREGATES) WHICH CAN REPLACE THE PREVIOUS STRUCTURES.
APPYING HACTIVISM

ACCORDING TO BUCSH AND PALMAS, HACKING IN THE TERMS OF ABSTRACT HACTIVISM MEANS “OPERATING AT A LOW LEVEL, USING EXISTING INFRASTRUCTURE AND POWER OF A SYSTEM TO TINKER, TWIST, AND MODULATE IT AFTER THEIR OWN WILL. BUILDING ON THE EXISTING SYSTEM WITH LOCAL PATCHES AND MODIFICATIONS. ADDING SMALL PROGRAMES TO THE TOOLBOX AND PRESENTING THEM WITH A JOURNEY ON THE SAME STREAM. DENDING THE FLOW OF POWER, BUT KEEPING THE CURRENT ON.”

HOW WE COMPUTERS, ESPECIALLY HACKING AS A CONCEPTUAL MODEL, HAS CHANGED THE WAY WE UNDERSTAND THE WORLD AND HOW ONE OPERATES IN IT. SUCH WAYS OF THINKING ARE IMPLEMENTED INTO VARIOUS FIELD:
THE INTERNET OF THINGS

From the Library of Babel, theorist Benedik, states that “losing the ballast of materiality” is information’s natural tendency to escape from its material world. This thesis claims that with the emergence of the Internet of Things, there is a re-emergence of information back into its material world. This thesis is speculating through the diagram on how to visually represent the emergence of the virtual world into the physical world.

LOSING THE BALLAST OF MATERIALITY

The Theater of Memory was proposed by the 16th century polymath Giulio Camillo Delmio in his book L’Idea del Threatro and highlighted by Francis Yates in The Art of Memory. Within the library, the drawers and shelves that make up the theatre’s seven graded stalls are all thing conceive. The knowledge contained within this extraordinary building is ordered through a master classification system which is both physically and conceptually held aloft by Solomon’s seven pillars of wisdom and organized by the seven known planets. This represents nothing less than a perfect organization of objects and the ideas they articulate. The scholar is comforted by the knowledge that this building is constructed to channel his power to navigate the stalls of the theater where he will have a perfect mental representation of the theater and an ability to navigate through any discourse and comfortably inhabit any subject.

However, this one to one representation of our physical and mental organization of information is disrupted in the Library of Babel. Within this library is a seemingly infinite pattern of rooms stretching horizontally and vertically in all directions. The repetition of identically bound books and the invariability of each library cell is a sure indicator that the vast building is not governed by a master system but is rather a cathedral of randomness, chance and improbability. First described in the twentieth century in one of Jorge Luis Borges’s most enduring stories. As described by architectural theorist Benedik, losing the ballast of materiality is the virtuous nature of the information’s escape from its material prison. Architecture as a material practice can also be understood as patterning of information. In a world of dematerialized information, buildings are information objects and architecture is pattern making activity.
According to Robert Dade-Roberton, through the Internet of Things navigation is no longer schema but embedded in a material world where computation systems can be literally navigated. As we move through physical space we are moving through computational space. Through computation, both the virtual world and the physical world began to inform how space is perceived. As Robertson states, "Computation has the potential to constrain how we interact with space, where space shape categories and categories shape space. Architecture articulates these spatial differentiations but is also differentiated by them."

Mediated Spaces

Integrating semantic space into physical space is possible through mediated spaces:

Augment Spaces - refers to a strategic and direct one-to-one mapping of place, object and information.

Enacting Space - like augmenting space but with the process of interface and filtering.

Transduction Space: an object or person can be located in ways which they are unaware and have no direct access to spaces that are tactical. It could be in reality strategic through systems which generate invisible association between places.
THIS THESIS ATTEMPTS TO APPLY THE CONCEPTS OF AI (THE ARCHITECTURE OF INFORMATION; ARCHITECTURE, INTERACTION DESIGN AND THE PATTERNING OF DIGITAL INFORMATION BY MARTYN DADE-ROBERTSON) TO THE FIELD OF ARCHITECTURE THROUGH THE MANIFESTATION OF DIAGRAMS. THE DIAGRAM WILL EXPLORE AND CONSTRUCT ONE’S INTERACTION WITH THE PHYSICAL BUILT ENVIRONMENT AND THE IMMATERIAL (WEB SITES AND HYPERLINKS) WORLD OF INFORMATION. IT WILL EXPLORE AND BEGIN TO BRING TO LIGHT THE PARALLEL RELATIONSHIP BETWEEN THE EMERGENCE OF THE VIRTUAL WORLD INTO THE PHYSICAL WORLD THROUGH IOT AND THE DIAGRAMS EMERGENCE FROM THE ICON AS SEMIOTIC TO THE ICON AS AN OBJECT IN THE PHYSICAL WORLD.

HISTORY OF THE DIAGRAM

EVEN A CURSORY GLANCE THROUGH MICHAEL FRIENDLY’S HISTORICAL AND VISUAL SURVEY OF DIAGRAMS AND VISUALIZATIONS INDICATES THAT THIS IS A COMPLEX FIELD THAT OVERLAPS VARIOUS PARADIGMS OF KNOWLEDGE AND ENQUIRY. THIS HAS RESULTED IN DIVERSE DEFINITIONS OF THE DIAGRAM AND CONSEQUENTLY VERY DIFFERENT CONCEPTUALIZATIONS OF ITS PROPERTIES, FUNCTION AND USE. THESE DIFFERENCES ARE ALSO APPARENT IN THE WAY DIAGRAMS ARE DESCRIBED AND VALUED IN RELATION TO ARCHITECTURE AND SPATIAL DESIGN AND WITH RESPECT TO QUESTIONS OF VALIDITY, TRUTH STATUS, THEIR ONTOLOGICAL STANDING AS BOTH PROCESS AND OBJECTS, AND AS MENTAL AND MATERIAL PHENOMENA. AS ALAN BLACKWELL AND YURI ENGELHARDT’S A META-TAXONOMY DIAGRAM RESEARCH INDICATES, THE FIELD IS A FRAGMENTED MIX OF DISCIPLINES, SCHOOLS OF THOUGHT AND OFTEN DISJOINTED RESEARCH PROJECTS. IT SUGGESTS MANY WAYS IN WHICH ARCHITECTURE AND SPATIAL PRACTICE WILL AND COULD ENGAGE WITH THIS IMPORTANT FIELD OF MULTIDISCIPLINARY VISUAL AND SPATIAL PRACTICE AND KNOWLEDGE. FIRST ARCHITECTURAL DIAGRAM ARE


DIAGRAMS NOW AND THEN

THE DIAGRAM AS AN ABSTRACT MACHINE HAS BEEN THE MOST INFLUENTIAL IDEA CONTRIBUTED BY THE WRITINGS OF DELEUZE WHO WAS INFLUENCED BY OTHERS LIKE BACON, PROUST AND FOUCALUT. THE DIAGRAM HAS BEEN DESCRIBED AS PROCESS, PRODUCT, PATTERN, OBJECT, STRUCTURE, VISUALISATION, CONCEPT, IDEA, EVENT, FLOW, DETAIL, PRIMARY GENERATOR, RECORDING, INTUITION, TOOL, TRACE, PROPOSITION, SOLUTION, CONCLUSION, AGENT/AGENCY, OCCASION, FORMULA, HEURISTIC, MNEMONIC, INTERFACE, VEHICLE, VESSEL, POTENTIAL AND FORCE. DIAGRAMS (LIKE PROCESS-BASED AND CONCEPTUAL WORKS OF ART AND ARCHITECTURE) CAN BE HIGHLY OBSCURE, ESOTERIC AND PERSONAL, AND MADE, USED AND EXPERIENCED IN SUCH UNCERTAIN MENTAL STATES CONTEXTS AND CONDITIONS THAT THEY CAN BE CONSIDERED IN UMBERTO ECO’S SENSE. POLYGUOUS, OPEN WORKS OF SORTS. SOME THEORIES AND HISTORIES OF ARCHITECTURE PRIVILEGE, SUBLIMATE AND POSITION THE DRAWING IN BINARY, HIERARCHICAL, OPPOSITION TO THE DIAGRAM WITHOUT CONSIDERING THE WAYS IN WHICH THEY INTERACT AND CAN DO SO IN DistinguishABLY, AS PARTS OF MORE GENERAL CATEGORIES OF IMAGES, VISUALISATIONS, MEDIA, AND COMMUNICATIONS ARTIFACT AND SYSTEMS. PARTLY
A RESULT OF THE DIGITAL REVOLUTION, THE PRESENT
DIAGRAMMATIC REVOLUTION IS ALSO A REVOLUTION IN
THE MEDIA AND PROJECTION SYSTEMS OF ARCHITECTURE.
THE DIAGRAM IS CONSIDERED SUFFICIENT AND NECESSARY
CONDITIONS FOR ARCHITECTURE. THE DIAGRAM HAS NOW
‘USURPED’ THE PLACE OF THE DRAWING.

FROM MENTAL TO MATERIAL STATES

THE DIAGRAM IN ITS ASSERTION OF GEOMETRY AS THE BASIS
OF ARCHITECTURE, IT OPENS THE WAY FOR A THOROUGH
DIGITALIZATION OF THE FIELD. MORE FUNDAMENTALLY, THE
INTERSECTION OF DIAGRAM AND MATERIALITY IMPELLED BY
DIGITISATION UPSETS THE SEMIOTIC DISTINCTION DRAWN BY
CHARLES SANDERS PEIRCE AS THE DIAGRAM BECOMES LESS
AND LESS AN ICON AND MORE AND MORE A BLUEPRINT, OR
ALTERNATIVELY, THE ICON INCREASINGLY TAKES ON THE
CHARACTERISTICS OF AN OBJECT IN THE WORLD. PARALLEL
TO IOT, THE DIAGRAM “HAS THE POTENTIAL TO CONSTRAIN
HOW WE INTERACT WITH SPACE. WHERE SPACE SHAPE
CATEGORIES AND CATEGORIES SHAPE SPACE.”
DESIGNING THE DIAGRAM

THE DIAGRAM WILL WORK UNDER THE CONSTRAINTS OF 2D SPACE WITH THE USE OF AUTOCAD AS THE DRAWING MEDIUM. IT WILL ATTEMPT OF REDUCE AND COMBINE ONE’S INTERACTION OF THE FINITE PHYSICAL WORLD OF THE BUILT ENVIRONMENT AND THE INFINITE WORLD OF WEBPAGES AND HYPERLINKS INTO SOMETHING THAT WILL SYNTHESIZE AND REVEAL BOTH MATERIAL AND IMMATERIAL WORLDS SPATIALLY STRUCTURED AND CONTROLLED.

CONCEPTS AND PARAMETERS

IN THE ARCHITECTURE OF INFORMATION ARCHITECTURE, INTERACTION DESIGN AND THE PATTERNING OF DIGITAL INFORMATION BY AUTHOR MARTYN DADE-ROBERTSON, STATES THREE OTHER COMPONENTS OF HOW ONE WOULD INTERACT AND CONCEPTUALIZED THE WWW OR INFORMATION SPACE’S INFINITE AND COMPLEX STRUCTURE. THIS THESIS WILL ATTEMPT TO USE THE METHODOLOGY OF SPACE SYNTAX AS WELL BY THESE THREE CONCEPTS OF INFORMATION SPACE TO BRING TOGETHER THE MATERIAL AND IMMATERIAL WORLD. THE THREE CONCEPTS ARE: INTERACTION, SCREEN, AND SEMANTIC SPACE.

THE CONSTRAINTS OF 2D REPRESENTATION WILL ASK THE DIAGRAM TO CONSIDER ‘OPERATIONS’ OF HOW TO CONCEPTUALIZE AND CONSTRUCT THE DIAGRAM (E.I. CONTAINMENT, CLOSENESS, LOCATION, LAYERING, OVERLAP, TIME, ETC. THE DIAGRAM IN ITSELF ALSO OPERATES AS A SEMANTIC SPACE. ROBERT DADE-ROBERTSON STATES, THESE METHODS CONCEPTUALIZE SEMANTIC SPACE AS CONSISTING OF TOPOLOGIES OF OBJECTS, CONTAINERS AND GEOMETRIC RELATIONSHIPS, WHERE MEANING IS ARTICULATED THROUGH DEGREES OF CONNECTIVITY, CONTAINMENT AND DISTANCE.
Connectivity - A product of the topological restrictions that govern how places can be found to be adjacent to one another in a 2D plane. It is equivalent to meaningful relationships.

Containment - A conceptualization of how an closeness - equivalent to similarity. The notion of closeness implies to a geometric limitation placed on objects that have measurable distances between them.

The notion of closeness implies to a geometric limitation placed on objects that have measurable distances between them. It is equivalent to similarity.
Interaction Space

This describes the input actions of a user that change the computer's output. For example, clicking on a link causes a webpage to change its content; typing in a search query will cause a list of web pages to appear in Google, etc. Different types of interaction are mapped on to different types of screen space so that they reinforce each other. 3

Screen Space

Constrained by the number of available pixels and the visual language used to display information. It can include web pages, a desktop GUI, a complex graph-based visualization or a 3D world, and each type of representation is constrained by metaphors and their visual rhetoric. 4

Semantic Space

Derived from the work of Kaplan and Moulthrop and defined as the structure of information held with a computer. It consists of information objects and their relationships to one another described through, for example, hypertext links or database fields. It is a tool for analysis: any information retrieval system is effectively a series of translations from raw data to ordered data, where some form of filtering has taken place to reveal structure, sometimes in the view of visualizing the results in the form of a diagram or to support the process of search and retrieval in complex information space. 5
AN INDIVIDUAL INTERACTION IN INFOSPACES

To start of the analysis of how an individual navigates and experience spatial structure and control in both physical and virtual infospace, I used myself as the test ‘site’. In doing this I analysed my day’s interaction on the internet in which I navigate from webpage to webpage and my interaction in the built environment in which I navigated from room to room and building to building.

THE DIAGRAM

The uses Martyn Dad-Robertson’s three conceptual spaces in the diagramming concepts and contains of a 2D representation.
**Questionnaire: Daily Life in Vietnam: Physical and virtual Interaction.**

Detail Narrative of your daily activities in Vietnam. What do you do when you wake up in the morning to when you sleep at night. Remember to include things in both your physical and virtual environment in your description (people you interact with in the physical and the virtual world and interactions with virtual and physical space of consumption, contribution etc. Feel free to attach the links in the description.

<table>
<thead>
<tr>
<th>Time</th>
<th>What, Where, When</th>
<th>Are you on the computer, phone, ipad, etc.? (what applications are you using) or the WWW (what sites and how did you navigate to it?) (be aware of even in the small instances that you use any devices to get onto the <a href="http://WWW">WWW</a>.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:46</td>
<td>Woke up in bedroom.</td>
<td>Check SU email (click) on “Interview” (Google search) “Ganoff” (click) “Garoff” (click) on Tom’s newsfeed Gmail - (click) on “Trieu” (tab) google doc “Trieu” (tab) AutoCad “Diagram”</td>
</tr>
<tr>
<td>7:56</td>
<td>Wrote down activities.</td>
<td></td>
</tr>
<tr>
<td>8:00</td>
<td>Clean bedroom.</td>
<td></td>
</tr>
<tr>
<td>:05</td>
<td>Walk out of bedroom, into hallway, and into the bathroom. Walk into the bathtub.</td>
<td>“thinking about the diagram at the same time.”</td>
</tr>
<tr>
<td>8:15</td>
<td>Out of the shower. Brush teeth.</td>
<td></td>
</tr>
<tr>
<td>:17</td>
<td>Finish brushing teeth.</td>
<td></td>
</tr>
<tr>
<td>:20</td>
<td>Walk out of bathroom, into hallway, and into bedroom.</td>
<td></td>
</tr>
<tr>
<td>8:20</td>
<td>Get dressed for interview.</td>
<td>sweep down on phone and then tab to check on weather,</td>
</tr>
<tr>
<td>:36</td>
<td>Clean bedroom.</td>
<td></td>
</tr>
<tr>
<td>:40</td>
<td>Walk out of room, into the hallway, into living room and into kitchen. Wash dishes.</td>
<td>* Washing thoughts: we perceive space relative to time not its actual size or dimension. We</td>
</tr>
</tbody>
</table>

* *
IT IS IMPOSSIBLE TO UNDERSTAND THE INTERNET IN VIETNAM WITHOUT TAKING INTO CONSIDERATION THE ECONOMICS AND POLITICS WITHIN THE GLOBAL AND NATIONAL BOUNDARIES. ECONOMICS AND POLITICS ON THE GLOBAL SCALE SHAPES THE HIERARCHICAL PHYSICAL INFRASTRUCTURE OF THE INTERNET. ON THE NATIONAL SCALE, WITH PRESSURE FROM THE GLOBAL MARKET, VIETNAM'S INTERNET IS A MECHANISM FOR IT'S BLOOMING FOREIGN INVESTMENTS AND TRADE, BUT A DETERRENT TO FLOWS OF POLITICAL CONTENT. ACCESS TO INFORMATION IS CONTROLLED THROUGH THE INTERNET'S PHYSICAL INFRASTRUCTURE AND THROUGH VIRTUAL SOFTWARE.

THIS SPATIALITY THAT IS CONTRARY TO THE OPTIMISTIC VIEWS THAT ANY DIGITAL WORK CAN BE LOCATED ANYWHERE ON EARTH THROUGH SOCIO-ECONOMIC RESTRICTIONS. THUS, INTERNET WHICH CONSISTS OF MAINLY FIBRE-OPTIC CABLES, THAT ARE GEOGRAPHICALLY SELECTIVE AND CONCENTRATED IN NORTH AMERICA, EUROPE, AND PARTS OF THE ASIA PACIFIC REGION. GEOGRAPHICALLY THE INTERNET RESEMBLED A STAR WITH THE UNITED STATES AT ITS CENTER IN THE LATE 1990S. INTERNET TRAFFIC BETWEEN OR WITHIN TWO CONTINENTS OTHER THAN NORTH AMERICA WERE ROUTINELY ROUTED THROUGH A US NODE OF THE INTERNET, ALTHOUGH INCREASING BANDWIDTH IN OTHER REGIONS MAY CHANGE THIS GEOGRAPHY OF FLOWS.

GLOBALIZATION: THE TRANSNATIONAL ELITE CLASS AND THE METROPLIS-SAELITE MODEL

THE FOUR MAIN FRACTIONS OF THE TRANSNATIONAL CAPITALIST CLASS:

CORPORATE FRACTION - EXECUTIVES OF TRANSNATIONAL CORPORATIONS AND THEIR LOCAL AFFILIATES

STATE FRACTION - GLOBALISING BUREAUCRATS AND POLITICIANS

TECHNICAL FRACTION - GLOBALISING PROFESSIONALS

CONSUMERIST FRACTION - MERCHANTS AND MEDIA
UNITED STATES & CANADA 4,978 Gbps
EUROPE 10,318 Gbps
ASIA-PACIFIC 2,174 Gbps
LATIN AMERICA & CARIBBEAN 1,27 Gbps
AFRICA 74 Gbps
Penang, a Malaysian peninsula, is leased by the British East India Company. Penang is the first British session in the Malay States and southeastern Asia.

1840: Samuel Morse submerged an insulated tarm hemp and India rubber in the New York Harbor.

1849: Gutta-percha, a insulating gum with could be applied to the wire made its appearance.

1856: Whitehouse published a paper concerning Thomas's theories of a transcontinental cable.

1858: Atlantic Telegraphy Company laid the transcontinental cable from Ireland to Great Britain.

1861: A submarine cable between the United States and Great Britain allowed for the first successful exchange between President Buchanan and Queen Victoria.

1866: A submarine cable between the United States and Great Britain allowed for the first successful exchange between President Buchanan and Queen Victoria.

1876: 70,000 seeds of the rubber tree (gutta-percha) brought from the Amazon rain forest and a greenhouse in London. 2,800 out of these seeds that germinated were brought to the gardens in Penang.
1840: Samuel Morse submerged an insulated hemp and India rubber in the New York Harbor.

1849: A two mile wire coated with gutta-percha off the coast from Folkestone tested successful.

1861: A submarine cable between the United States and Great Britain allowed for the first successful exchange between President Buchanan and Queen Victoria.

1867: 70,000 seeds of the rubber tree (gutta-percha) are brought from the Amazon rain forest and planted in a greenhouse in London. 2,800 out of the 70,000 seeds that germinated were brought to the botanical gardens in Penang.

1876: 18,000 seeds of the rubber tree (gutta-percha) are brought from the Amazon rain forest and planted in a greenhouse in London. 2,800 out of the 18,000 seeds that germinated were brought to the botanical gardens in Penang.

1880: Gutta-percha, a insulating gum with could be applied to the made its appearance.

Late 1920s: William Thomas invents the first electrical pulses to automatically be translated into letters.
Since World War II, AT&T owned a monopoly over the construction of most of the international telecommunications systems as it was backed by the government. AT&T owned all of the customers within their borders and could charge any price they wished.
1989:
Kessler Marketing Intelligence Corp. (KMI), a company whose specialty is in tracking the world’s submarine cable systems, published a study on worldwide underwater fiber-optic systems with assumptions that a state-of-the-art cable from the United Kingdom to the Middle East could pay back investors in two to five years.

1990:
A study was completed and the favorable results created an interest from many investors such as Asian Infrastructure of Hong Kong and Telecom Holding Co. Ltd. of Thailand. The project also extended to form the Middle East to Tokyo. Telecom deregulation allowed for competition between PTT (Post, Telephone, and Telegraph) to land the fiber-optic cable.

1994:
FLAG’s Construction and Maintenance Agreement is signed and AT&T becomes the manufacturer of the cable and repeaters.

1996:
Contracts were written in Southern Thailand where it became the center of FLAG operation and construction. Manhole-making villages emerge consisting of local workers from men to women and young and old.

1980s: A generation of cable-savvy men began to divert corporate resources into R&D programs.
THE INTERNET DID NOT OFFICIALLY START IN VIETNAM UNTIL 1997 WHEN DECREES 21/CP ON NEW REGULATIONS RELATING TO THE MANAGEMENT, INSTALLATION AND USE OF THE INTERNET WAS PUT INTO EFFECT TO ALLOW FULL ACCESS TO FOREIGN INVESTORS AND COMMERCIAL USE WHILE CONTROLLING INFORMATION FLOWS THAT WOULD DEAL WITH THE POLITICAL PARTY. ALL INTERNATIONAL CONNECTIONS GO THROUGH TWO GATEWAYS IN HANOI AND HO CHI MINH CITY, WHICH WERE OPERATED BY VIETNAM DATA COMMUNICATION COMPANY. CONTROL OVER INTERNATIONAL DATA TRAFFIC WAS THEREFORE GIVEN TO THE GOVERNMENT AGENCY RESPONSIBLE FOR COMMUNICATION INFRASTRUCTURE. GOVERNMENT AGENCY ARE INTERESTED IN ITS ECONOMIC PROCEEDS, BUT RESTRICT ANY ACTIVITIES THAT MIGHT JEOPARDIZE ITS POWER.

ALL INTERNATIONAL CONNECTIONS GO THROUGH TWO GATEWAYS IN HANOI AND HO CHI MINH CITY, WHICH WERE OPERATED BY VIETNAM DATA COMMUNICATION COMPANY. CONTROL OVER INTERNATIONAL DATA TRAFFIC WAS THEREFORE GIVEN TO THE GOVERNMENT AGENCY RESPONSIBLE FOR COMMUNICATION INFRASTRUCTURE AND INTERESTED IN ITS ECONOMIC PROCEEDS.

THE REGULATION PROVIDED RELATIVELY EFFECTIVE CONTROL OVER THE INTERNET BY HOLDING ISPs, THE ORGANISATIONS DEALING DIRECTLY WITH THE END-USER, RESPONSIBLE FOR THE CONTENT ACCESSED BY ITS USERS AND REQUIRING THE ISPs, WHICH HAD TO BE LICENSED BY THE STATE, TO ELIMINATE INAPPROPRIATE USES, WHICH INCLUDE PORNOGRAPHY AND ANTI-STATE MATERIAL.

THE CONTROL OVER INTERNET CONTENT WAS FURTHER ENHANCED BY REQUIRING Internet Content Providers (ICPs), I.E. ORGANISATIONS HOSTING WEB-SITES OR OTHER CONTENT AS E.G. FILE TRANSFER PROTOCOL SITES, TO KEEP THEIR SERVERS IN VIETNAM AND RECEIVE A LICENCE FOR HOSTING SUCH SERVICES. THE MINISTRY OF CULTURE AND INFORMATION (MoCI) IS RESPONSIBLE FOR ESTABLISHING GUIDELINES REGARDING APPROPRIATE CONTENT ON THE INTERNET AND LICENSING ICPs.

MINISTRY OF THE INTERIOR IS EFFECTIVELY RESPONSIBLE FOR POLICING THE NET AND IMPLEMENTING ADEQUATE TECHNOLOGY TO DO SO. THE DGPT’s TASK IS TO PROVIDE ADEQUATE INFRASTRUCTURE, WHILE THE MoSTE IS RESPONSIBLE FOR RESEARCH AND DEVELOPMENT.
1980s and Early 1990s:
Vietnam's embargo and opposition for reform within its Party makes it difficult for international cooperation.

Sean. "Hackanoi Has Landed in Vietnam - A Hacker's Paradise".
Surborg, Björn. "Is It the Development of Underdevelopment?".
Surborg, Björn. "On-Line with the People in Line: Internet Bundled, Buried & Behind Closed Doors."
1988:
The Vietnam Post and Telecommunications Corporation (VNPT) cooperates with the first Western telecommunications firm, Telstra of Australia.

The Internet is released from its military and research environment in the United States and increasingly used for non-military and commercial purposes worldwide.

1989:
1992:
The first international connections are established by the Institute of Information Technology (IOIT) in Hanoi through a dial-up connection to the Coombs Computing Unit at the Australian National University (ANU).

Two internal networks were set up in Vietnam. The IOIT established the Vietnam Academic Research and Educational Network (VARENet) for the research community. The Cooperation Internationale pour le Development et la Solidarite set up a second network, Netnam, for the international community in Vietnam.

Prime Minister, Vo Van Kiet, sent an email to Swedish Prime Minister Carl Bildt.

VARENet expanded to about 1500 collective individual users.

Other intranets were set up. Some include VietNet by Khanh Hoa Post Office, Vietnam Wisdom by Financing and Promotion of Technology and Environment (MoSTE) VN-Mail by the VNPT's subsidiary Vietnam Data Communication Company (VDC), ViNet-Batin by the joint venture Batin and VitraNet by the Ministry of Trade.

VARENet subscribers included a few hundred Vietnamese professionals. There were about 200 Internet connections from the various networks, but no single Internet Exchange Provider (IXP).

1992: The first international connections are established by the IOIT in Hanoi through a dial-up connection to the Coombs Computing Unit at the Australian National University (ANU).

1993: Two internal networks were set up in Vietnam. The IOIT established the Vietnam Academic Research and Educational Network (VARENet) for the research community. The Cooperation Internationale pour le Development et la Solidarite set up a second network, Netnam, for the international community in Vietnam.

1994: Prime Minister, Vo Van Kiet, sent an email to Swedish Prime Minister Carl Bildt.

1995: VNPF recognize the commercial potential of the Internet and became highly protective of its monopoly as a data carrier.

1997: The Internet is fully operational in Vietnam. Legislation of Decree 21/PC required all international connections to go through one of two gateways, Hanoi and Saigon.

Power struggle between the DGPT and the National Center of Natural Sciences and Technology including IOIT over the control of the Internet.

1998: VARENet expanded to about 1500 collective individual users.
In 2001, the Vietnamese Government implemented Decree 21/CP that had been the legal framework for the Internet market. This decree contained a partial liberalization of the Internet market on one side and more strict on government and license requirements. In February 2002, five new ISPs were licensed, including two additional Internet Exchange Providers (IXPs) owned by FPT and a company Viettel. MoCI decided to coordinate with the MPT and the Police to conduct regular surveillance of Internet content. ISPs are likely to have network security software installed free-of-charge to prevent users from accessing "harmful" websites.
<table>
<thead>
<tr>
<th>Kitchen</th>
<th>Bedroom</th>
<th>Ba</th>
<th>WS</th>
<th>WS1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hu</td>
<td>Hu</td>
<td>Hu</td>
<td>Hu</td>
<td>Hu</td>
</tr>
<tr>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>LT</td>
<td>LT</td>
<td>LT</td>
<td>LT</td>
<td>LT</td>
</tr>
<tr>
<td>TL</td>
<td>TL</td>
<td>TL</td>
<td>TL</td>
<td>TL</td>
</tr>
<tr>
<td>Ta</td>
<td>Ta</td>
<td>Ta</td>
<td>Ta</td>
<td>Ta</td>
</tr>
<tr>
<td>Ch</td>
<td>Ch</td>
<td>Ch</td>
<td>Ch</td>
<td>Ch</td>
</tr>
<tr>
<td>Sk</td>
<td>Sk</td>
<td>Sk</td>
<td>Sk</td>
<td>Sk</td>
</tr>
<tr>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Ca</td>
<td>Ca</td>
<td>Ca</td>
<td>Ca</td>
<td>Ca</td>
</tr>
<tr>
<td>Pl</td>
<td>Pl</td>
<td>Pl</td>
<td>Pl</td>
<td>Pl</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>RF</td>
<td>RF</td>
<td>RF</td>
<td>RF</td>
<td>RF</td>
</tr>
<tr>
<td>BI</td>
<td>BI</td>
<td>BI</td>
<td>BI</td>
<td>BI</td>
</tr>
<tr>
<td>CM</td>
<td>CM</td>
<td>CM</td>
<td>CM</td>
<td>CM</td>
</tr>
<tr>
<td>MW</td>
<td>MW</td>
<td>MW</td>
<td>MW</td>
<td>MW</td>
</tr>
<tr>
<td>Ta</td>
<td>Ta</td>
<td>Ta</td>
<td>Ta</td>
<td>Ta</td>
</tr>
<tr>
<td>Ps</td>
<td>Ps</td>
<td>Ps</td>
<td>Ps</td>
<td>Ps</td>
</tr>
<tr>
<td>17</td>
<td>9</td>
<td>11</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Lower Manhattan’s 60 Hudson Street is one of the world’s most concentrated hubs of Internet connectivity. This short documentary peeks inside, offering a glimpse of the massive material infrastructure that makes the Internet possible.

Internet machine is a multi-screen film about the invisible infrastructures of the Internet of one of the largest, most secure and fault-tolerant data-centres in the world, run by Telefonica in Alcalá, Spain. The film reveals the hidden materiality of our data by exploring some of the machines through which the cloud is transmitted and transformed.

SubComChannel. TE SubCom – Installation Animation – Undersea Fiber Optic Cable, 2011. https://www.youtube.com/watch?time_continue=192&v=Gsoo_B0wrrM.
An animation illustrating the installation process of connecting the cable to the landing station and the process of burying the cable under the ocean seabed.

SubComChannel. TE SubCom – Repair Animation – Undersea Fiber Optic Cable System, 2011. https://www.youtube.com/watch?time_continue=1&v=m6qTk5WNq9E.
An animation illustrating the process of repairing a broken segment of the cable.

TEC SubCom is a vertically integrated company. They are in charge of all aspects of the submarine fiber optics business from production to installation.


Shortly before the end of 2013, we published the first of a three-part interview with Patrick Sharbaugh of Vietmeme, focusing on civic life in Vietnam as seen through and influenced by the web. We continue that discussion with the second in our series, looking at censorship and surveillance within the country. Some of the dates referenced in this article come from the date of the interview in November 2013.


How It Works – Transatlantic Fiber Optics. Accessed October 26, 2015. https://sites.google.com/site/bit4554 fiberoptics/how-it-works. The change in business structure from an agreement between two or more companies connect their customers together to private corporations building their own networks lease cables to the highest bidders. The installation process of fiber optic cables.

How It’s Implemented – Transatlantic Fiber Optics. Accessed October 26, 2015. https://sites.google.com/site/bit4554fiberoptics/how-it’s-implemented. The change in business structure from an agreement between two or more companies connect their customers together to private corporations building their own networks lease cables to the highest bidders. The installation process of fiber optic cables.

Open Source History: Tracing the Origins of Hacker Culture and the Hacker Ethic. Accessed October 27, 2015. http://thevarguy.com/open-source-application-software-companies/042915/open-source-history-tracing-origins-hacker-culture-and-ha. The article questions the creation of monumental platforms such as Linux, Hadoop, etc as a result of hacking culture but a result of academia. In the comments, a refute is made that academia is not apolitical and thus a hacking ethos is separate from academia. While many programer create open source software today, the ‘hacker ethic’ has very little impact. Rather these ideologies have very real applications to very real problems.

Report: There’s More Censorship Circumvention in Vietnam than in Any Other Nation. Vietmeme. Accessed October 27, 2015. http://vietmeme.net/2014/07/15/report theres more censorship circumvention in vietnam than in any other nation/. Heavy censorship in Vietnam has created a new class of well literate internet users in the art of circumvention. Although the site is blocked, Facebook is growing in users not only by Vietnamese citizens but by Vietnamese businesses. In addition, there is a growing culture of political criticism and activism.


Academic Articles/Journals/Books:

In the nineteenth century, the motor replaced the clockwork as the universal model of knowledge. In a similar vein, new media technologies are currently replacing the motor as the dominant conceptual technology of contemporary social thought. This development, von Busch and Palmås argue, has yielded new ways of construing politics, activism and innovation. The authors embark on different routes to explore this shift. Otto von Busch relates the practice of hacking to phenomena such as shopdropping, craftivism, fan fiction, liberation theology, and Spanish social movement YOMANGO.

The Internet in Vietnam is not a ubiquitous and widely available technology, rather it is a piece of infrastructure that is unevenly available across social and regional spaces. It provides a business tool for a transnational capitalist class and its local affiliates to access the resources of Vietnam’s economy. Such infrastructural implementation, Surborg argues is a strategies used to control internet access.


This paper examines the efforts of the Vietnamese government and the Vietnamese Communist Party to control cyberspace as well as the physical spaces through which the virtual world is accessed. The paper traces the development of the internet as well as the regulatory environment surrounding it.