GEX1003 Seeing the World Through Maps
AY25/26, Y3S1
Notes

Sim Ray En Ryan

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Contents

1 Admin

1.1 Admin

- 25%: CA1 Maps in the Human World
- 25%: CA2 Maps in Digital Era
- 50%: Open Book 25 November Final Exam

2 Introduction of Concepts

2.1 Definitions

2.1.1 Maps

Maps are 2D spatial representations of 3D earth. It is a form of communicationg and viewing the earth's surface and involves a producer, medium, message, and consumer. It facilitates a spatial understanding of things, concepts, conditions, processes, or events in the human world.

- Inform: Education, Wayfinding
- Delight: Art, Decoration
- Inspire: Religious beliefs
- Project: Power, Possession (European Imperial maps from 1800s)

2.1.2 Cartography

A study and practice of making maps, involving processes, procedures, and protocls through which maps are created and used.

2.1.3 Epistemology

The study of how knowledge is derived. The epistemology of maps is the stufy of how accurate a map is and what the basis upon which a map is produced. Maps do not represent an unbiased depiction of reality, and conveys subjective impressions of human will and intention.

2.2 Concepts

2.2.1 4Ms

Mapmaker Who produced the map (Govt, Hotel)

Medium How is map represented (Paper, Digital)

Message What is the purpose of the map? To

- Give directions
- Plot journeys
- Describe places

- Locate phenomena
- Explain history
- Claim territory

Men/Women What is the target audience of the map?

2.2.2 Scale

Relationship between distance on map and distance on ground. 1:10 means 1cm on the map corresponds to 10 cm on the map. A small scale map has less details, but can show more land, and vice verca for a large scale map.

2.2.3 Projection

Mathematically impossible to depict round object on plane without distortion

Mercator Projection is good for navigation but makes areas at poles much larger

James Gall Projection focuses on size of land mass but distorts shape

Goode Projection focuses on land area and sinuous meridians

When choosing a map, we will preseve either direction, area, shape (conformal), or distance (equidistant)

2.2.4 Orientation

What is on top of the map, what is at the base, and what is at the center. THe normal expected orientation is that true north is at the top of the map. In other cultures, other mapping alternatives exist:

- Islamic Maps have South Orientation
- Medieval Maps orient to Jerusalem to the East
- Souvenir Maps in Southern Hemisphere are upside down

2.2.5 Symbols

Graphical representations of things, usually found in Legend. Can be dots, lines, objects, or pictorial.

Plan View looks straight down onto surface and usually has standard symbols

Panoramic, Bird's Eye captures heights of features and usually more informal

2.2.6 Grid

System of vertical and horizontal lines on map. The longtitude and latitude lines can specifically pinpoint any location.

2.2.7 LOSS

Legend, Orientation, Scale, and Symbols. Are these four alwasy present in all maps, and will you be loss if they are absent.

3 The First Maps: History

3.1 Introduction

The first maps are 40000 year old rock maps. While the medium and methods of creating maps have changed, the message and meanings remain constant. (A basic, enduring human instinct)

3.2 Development of Maps

Rock surfaces are carved to express beliefs, rituals, and way finding. They showed land surfaces and earth features, celestial (heavens and gods), cosmological (the universe and stars)

Rock maps usually did not have LOSS, and are difficult to interpret by us as we do not have their relgious contexts. We also do not know exactly how old they are, and they may not even be maps but rather decorations or worship items. The maps obviously could not be carried around easily.

However, maps were still important as it may provide relgious purposes, or practicality when hunting or knowing high locations (spatial knowledge)

3.2.1 Further On

Medium changed from rocks, caves, to wooden boards, paddles, canoe seats, body and skin tattoos. Hunter gatherers used map to plan land use, chart routes, and express creation beliefs and views of the universe.

Chukchi Russia an 1800s maps of river courses, vegetation, animals, housing, and trading acitvities sold to Russian government and foreign explorers to offer intelligence of remote places

Aborigine Australia Maps show creation, evolution, how to survive, cukture of the universe

3.2.2 Land Claims

The British colonised Australia in 1788, and in 1991, High Court ruled that native titles (through maps) are legitimate and can be used to assert claims on territory.

3.3 History of Maps

3.3.1 Renaissance

Rationality, objectivity, functionality. Eg, Mercator Projection

3.3.2 Cartography as Science

Established principles in map design such as triangulation, trigonometry to determine location and height. However, maps are also art and are both qualitative, quantitative, and subjective.

3.3.3 Communications Model

Maps as communication devices, influenced by Psychology, Information Theory

3.3.4 Semiology Approach

Study of signs and symbols and graphic design

3.3.5 Social Construction Perspective

Maps are social constructions by humans and human agencies, even leading to propoganda maps for economic and political development. Will now have deliberate inclusion and exclusion of certain features, ideological framing, and are not pure mirrors of the world.

Thus, we must always question who is the map maker, what hidden agenda they might have (political or economic)

3.3.6 Post Representational

How maps work and their effect on people.

3.4 Mapping Early Singapore

Singapore used to be called Bargungapura and Garsyn Gapara. Sin-Gapura is Gateway to China and not Singa-Pura (Lion City). Bar-Sin-Gapura means wrong, tricky, and difficult place to stop in.

3.4.1 European Maps

Indicates a settlement at the base of Mt Faber, a huge rock at Keppel Harbour that was destroyed, and was known as Sincapour with many red patches and cliffs.

3.4.2 Other myths

Singapore was never called Temasek, and Lion City can also be interpreted as Gateway to China or Place to Interrupt Voyage/

4 Maps of Power: Politics

4.1 Introduction

Maps are exertions of political mights and power, including military, artillery, and conquests. Governments map territories under their claim (Eg 9 Dash Line). Maps represent knowledge (and thus power) over places and people.

4.2 Colonial Maps

Mapping colonized territories is to claim space, control people. and contest others' claims of the space.

French Maps had most of America as 'new France' and minimised British presence a East Coast. British maps titled the east coast as New Britain, called the Atlantic Ocean 'Sea of British Empire', extended into 'France's' terrirory

Mitchell's 1755 map was used to settle border disputes between Britain, France, Spain, and America, and established the boundaries of the first 13 colonies to become the USA.

Shows that maps can be used for border disputes and demarcation, that some maps have more say than others.

Empty space in a map was also used to entice citizens to migrate to inner land (for sheep and cattle farming) so that the coast can be open for migrants.

4.2.1 Singapore

Jackson Plan for orderly urban development in Singapore. Malaysia and Singapore's maps of Pedra Branca also differed.

4.2.2 Thailand

Maps help raise a national consciousness of Thailand, and are able to see and imagine the nation as a nation and not an empty space of the other.

5 Maps that Lie: Economics

Mapmakers are human and subjective. They are often used to sell transport services or places. They simplify or amplify certain places for commercial purposes.

Every map is a reflection partly of objective realities and partly of subjective elemenets, and cannot be wholly objective as they reflect people's mental and moral qualities.

5.1 Subjectivities

5.1.1 Scientific Integrity

Do maps acknowledge ignorance?

5.1.2 Judgement

Critical acumen (decision) in selection of source materials, colors, symbols, leterring, consistency. We need to question the experience and skills of a surveyor / cartographer.

5.1.3 Taste and Aesthetics

A mapmaker can choose their own colors, shading, and pictorial symbols. Will they choose aesthetics or scientific and mathematical precision? Are the maps for popular use or for a specialized audience. Although aesthetics should have no bearing on a map's accuracy, it can show confidence and pruchase.

5.1.4 Simplification and Amplification

Simplification prevents over-crowding with 'useless' info, while amplification can highlight a certain feature.

5.1.5 Generalization

Maps can feature quantitative data?

5.1.6 Synthesisation

Bringing together two or more different elements, but it is subjective as someone has to decide this and create the mental model of corelation. May also suggest causation.

5.1.7 Progressiveness vs Conservatism

Conservative if it adheres to conventions such as blue water, red or brown mountains, symbols we are used to. Progressive if mapmakers use new symbols to represent never mapped phenomena, or data collected with new techniques.

5.2 Advertisment

- Biases
- Errors
- Generalization
- Map smoothing
- Simplification
- Disinformation

In this sense, advertising and cartography are similar as they communicate a limited version of the truth. Train maps will always emphasize on accessibility and convenience. Rail lines may be straight although the actual route is not. It may contain future developments, and even omit other transport lines.

Place map distances distort distances and make suggested travel times short. They also leave out competitors. They will name drop attractive surroundings, play up related businesses, make themselves the center.

6 Imagined Maps: Society-Culture

6.1

7 Collecting Maps: Personal-Aesthetic

7.1

8 From Paper to Pixels: The Evolution of Maps

8.1 Map Making Technology

The medium:

- Start from Rock and Clay
- Animal Skin and Leather
- Paper

The method:

- Longtitude and Latitude lines to pinpoint locations better by Ptolemy.
- Mercator is the first to map sailing courses on sphere into straight lines on a plane map. This allows ships to sail in a constant compass direction.
- Printing and Photogrammetry and Earth Observation (by satellites or pigeons) make it much cheaper and accessible

8.2 Digital Turn of Maps

Roger Tomlinson developed GIS which allows for spatial analysis. Google Earth (2005) was original a startup of putting digital maps together. In 2007, iPhone was launched and started mobile mapping era.

8.2.1 Haiti Earthquake

7.0 earthquake caused significant damage to the country. Shows the power of digital mapping for disaster response. Anyone from around the globe can watch a 5 minute tutorial and help out the efforts.

8.3 Evolution of Digital Maps

In parallel with improvement in sensing technology.

8.3.1 Early Digital Cartography

Mainly for military and census needs.

8.3.2 Rise of GIS

Geographic Information System. GIS went from Desktop to Mobile then to Cloud.

8.3.3 Web Mapping Emergence

Web 2.0 made static websites interactive and user driven, such as Google Maps. Dynamic user interaction, location based services, routing, Google Maps API.

8.3.4 Cloud and Mobile Mapping

Google cloud, AWS provide scalable cloud backend. Digital maps are now optimized.

8.3.5 Platform and AI Powered Mapping

Digital maps have extensive APIs and systems. Integrated with everyday service such as food delivery, ecommerce, real estate, logistics, and human mobility.

9 Where am I: Digital Maps in Everyday Life

9.1

10 What Maps Say: Thematic Maps and Storytelling

10.1

11 Environmental Impacts of Digital Maps

11.1

12 Social and Political Impacts of Digital Map

12.1