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The Theoretical Modeling on the Digitalized World History:

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Expound an idea, a train of thought and multiple possibilities

By Xudong Wang

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Introduction

- The informatization technology is embodying into the human daily life, changing human life style and giving impetus to the revolutionary breakthroughs in the human mind.
- **New world needs new historiography** (L.S. Stavrianos, 1999). The ubiquitous informatization revolution constructs the informatizational society dynamically as well as creates the conditions for the related new historiography.
- The new world history in information age, should be a kind of brand-new world history paradigm, **it has information-based visual angle, makes sure in real space-time and blends, can be on the basis of global nature and ecological environment changes, reflect the dynamic gradual progress of the human society omni-directionally.**
- Because of aforementioned background and consider, put forward this theory idea of “the Digital World History” here.

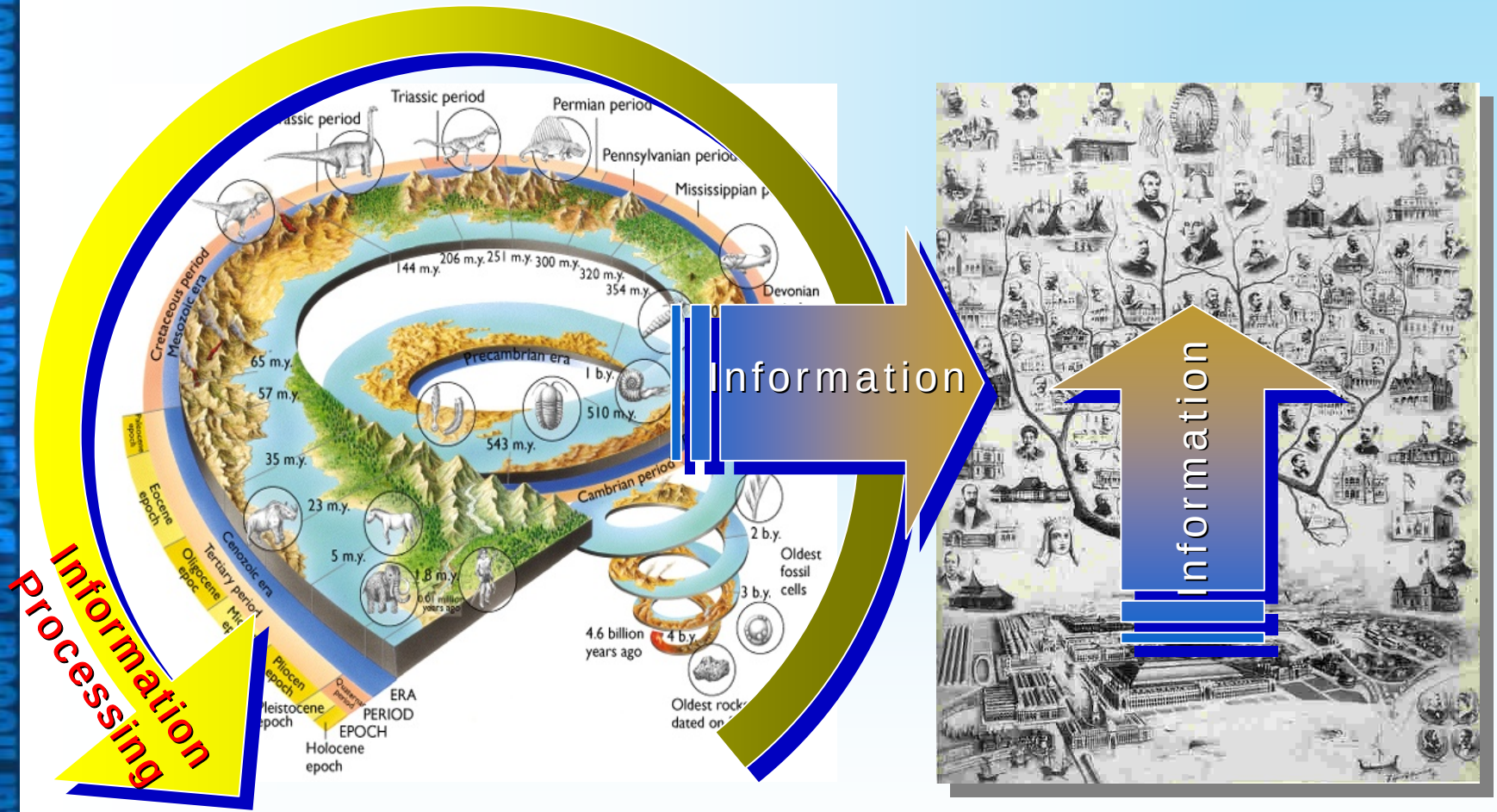
Contents

- Introduction
- **Prerequisite:**

  Information, social space-time and attribute of world history discipline

  - One, information processing and transmitting is the basic movement form in the human society.
  - Two, the record and cognition of human history is restricted by the information processing pattern.
  - Three, the world history discipline has unique information attribute.

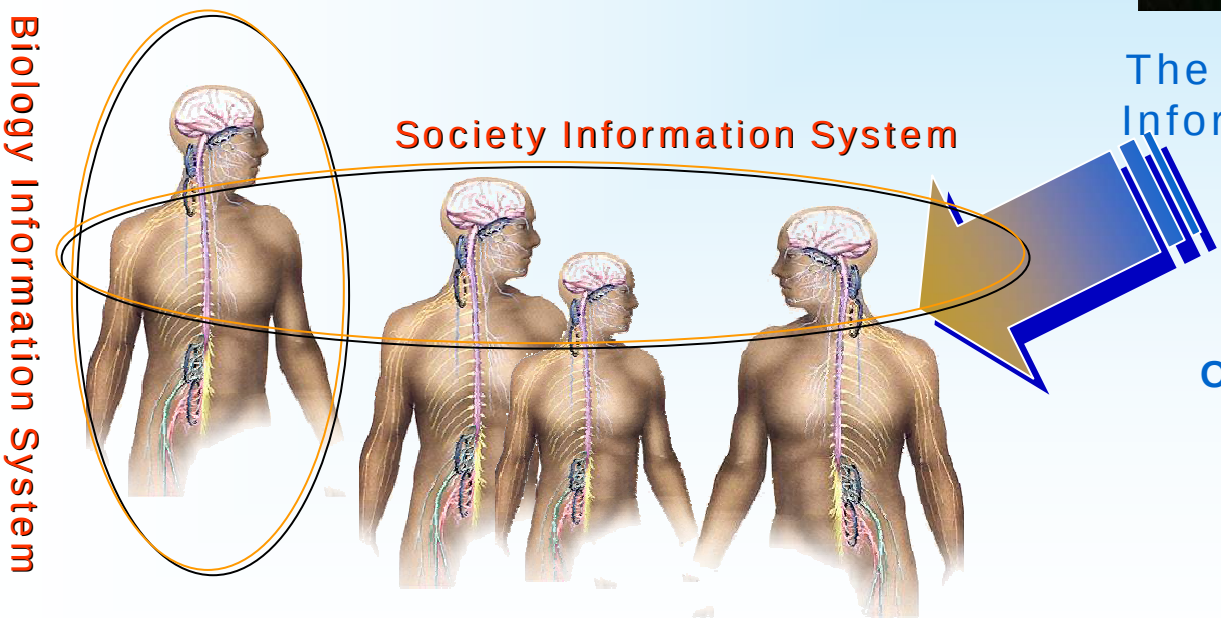
Prerequisite I: Information processing and transmitting is the basic movement form in the human society (A)



- **The information processing and transmission are one of the basic form of the nature biosystem movement. This attribute of nature biosystem determine the existence of the human society as well.**

Prerequisite I: Information processing and transmitting is the basic movement form in the human society (B)

- Original ecology: Multi-dimension information absorption; One-dimension information expression.



The Center of Human's Information Processing

- **The Brain**: Responsible for the information processing.
- **The Five Sense Organs**: Responsible for the information the receive, the transformation and the transmission.

Prerequisite I: Information processing and transmitting is the basic movement form in the human society (C)

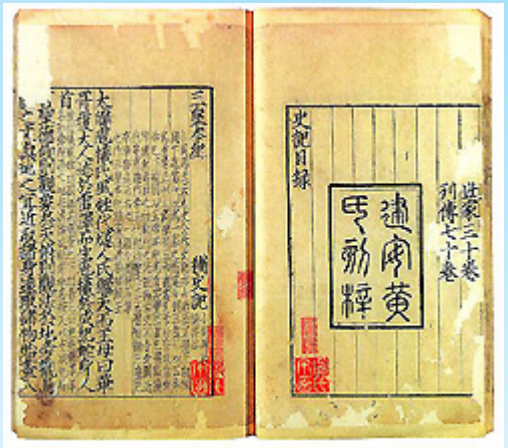
Information

The footprints, between 19 and 23 thousand years old.

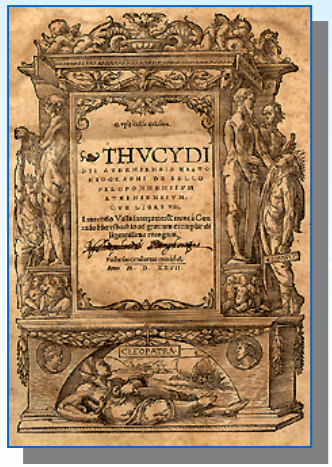
Pompeii

Bequeathed passively

Recorded initiative



Si Maqian: *Shi Ji*

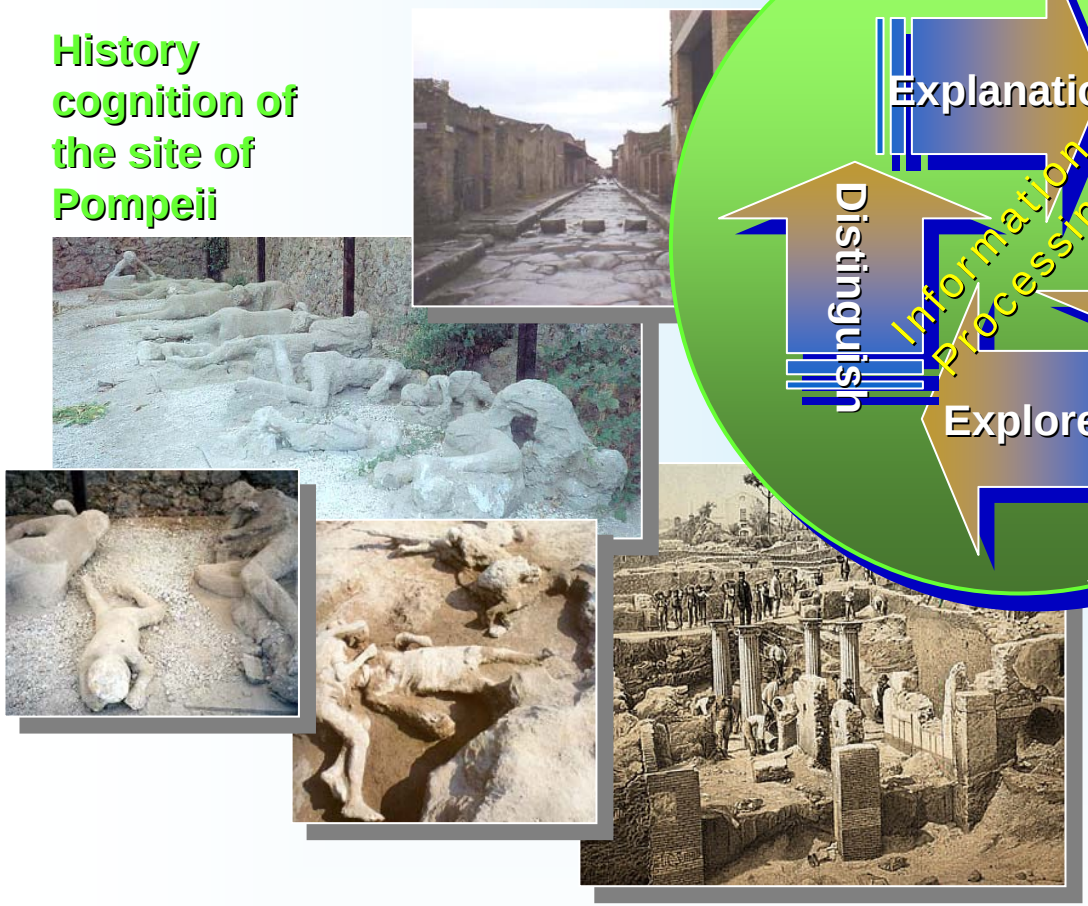


Thucydides: *History of the Peloponnesian War*

- In addition, human trace and record, regard a large number of one's own activity information as historical content stay, infect offspring with consciously. This objective phenomenon, let latecomer from ancestor there study to experience and lesson.

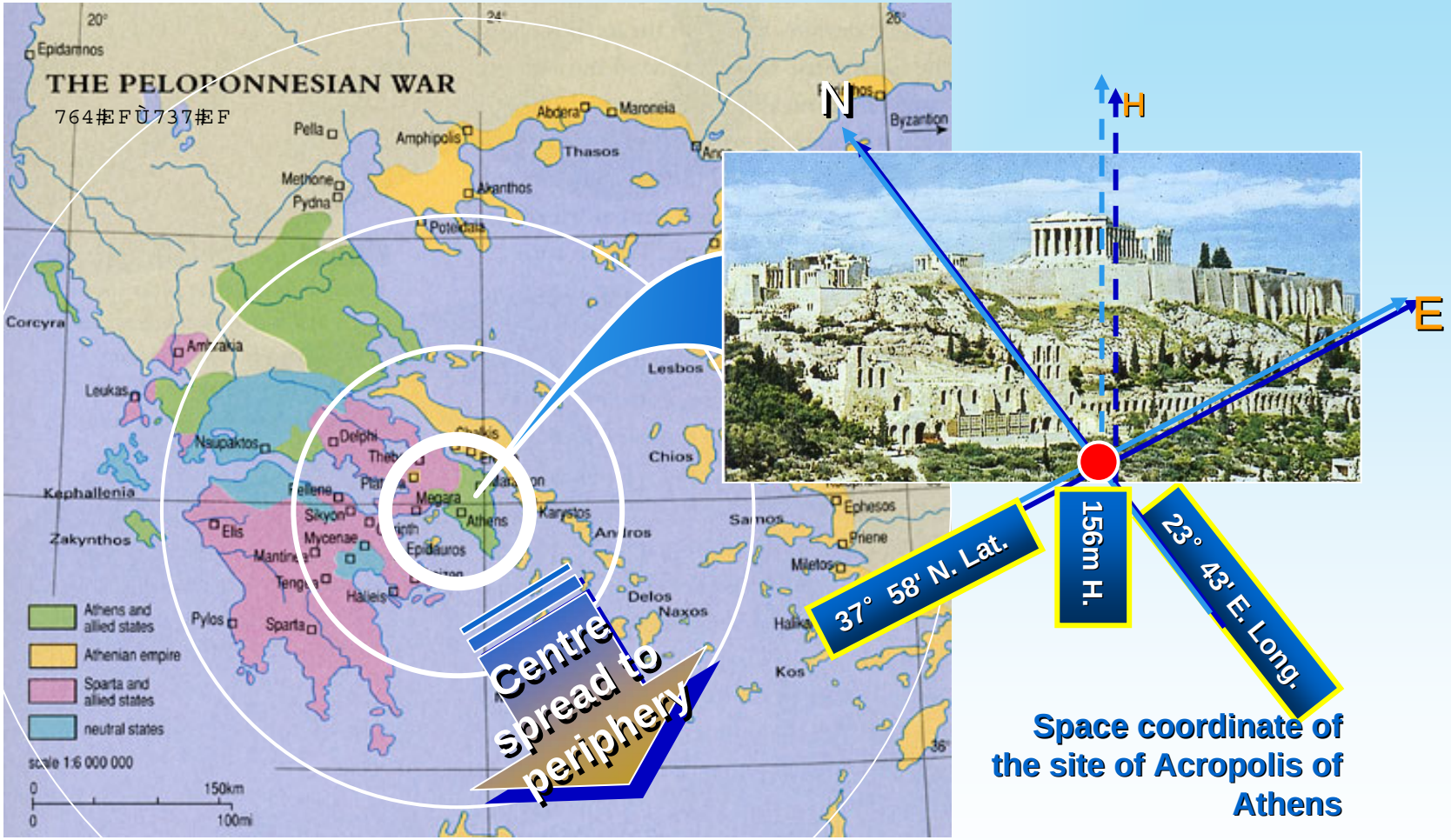
Prerequisite I: Information processing and transmitting is the basic movement form in the human society (D)

History cognition of the site of Pompeii



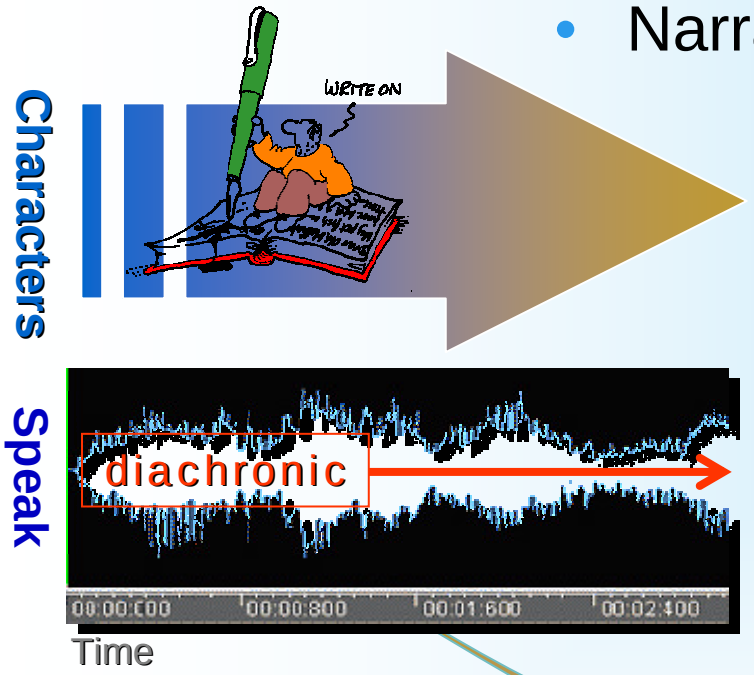
- **Human historical records and cognition, is a kind of information processing course in fact.**

Prerequisite II: The record and cognition of human history is restricted by the information processing pattern (A)



- **History in the objective meaning can be said to be the mankind multi-dimensional activity orbit in the "4D space-time" (i.e. the space three-dimension + time is linked).**

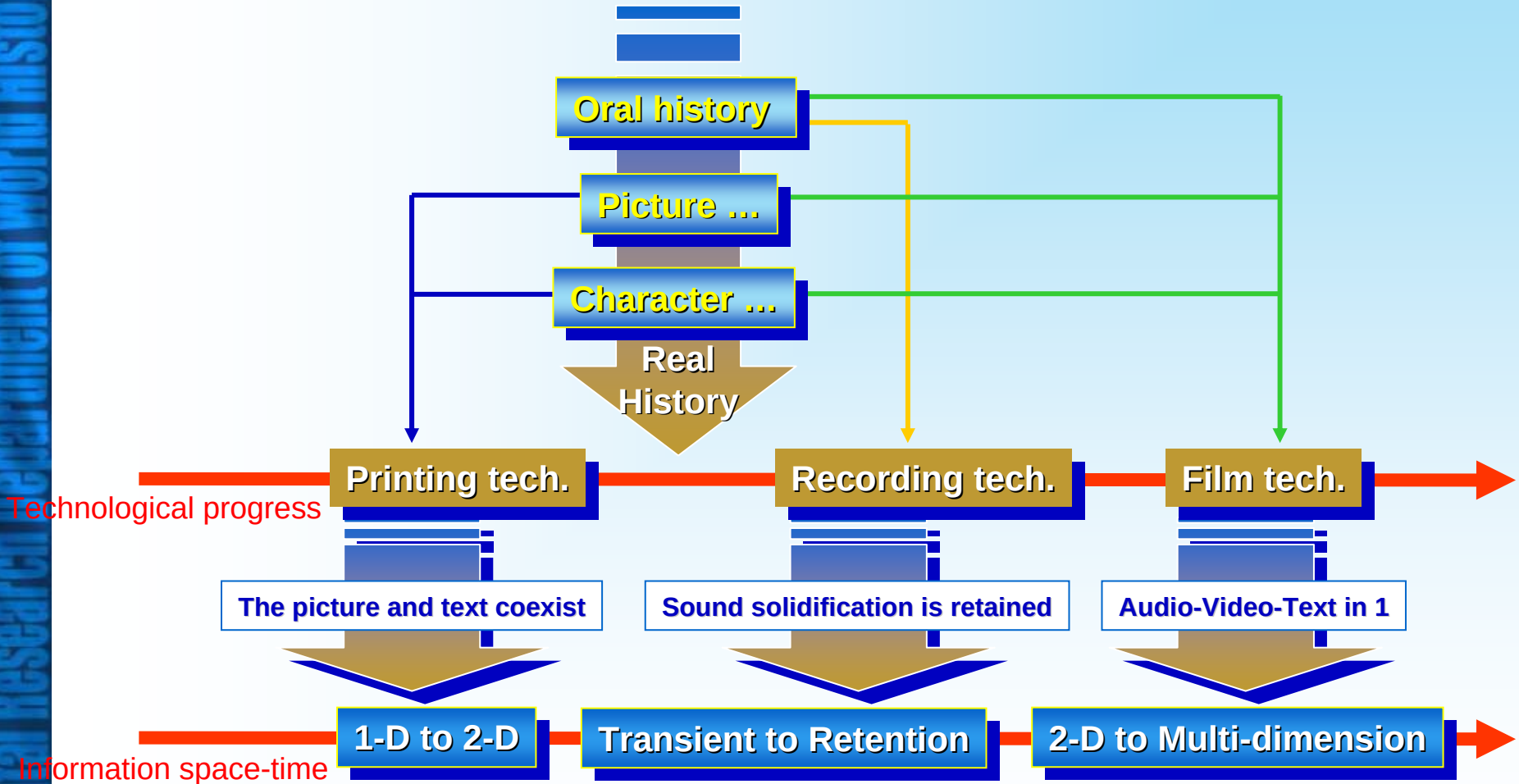
Prerequisite II: The record and cognition of human history is restricted by the information processing pattern (B)



- Narration of the oral or characters:
  - Its information content expressed because the words and phrases are arranged sequentially, diachronic time difference exists each other, so belong to one-dimensional pointing to single properties.

- **However, during the developing stage when the society is low in the engineering level of information, people have to confine the record of their own activities in the one-dimensional record of 1-D or 2-D.**

Prerequisite II: The record and cognition of human history is restricted by the information processing pattern (C)



- With the progress of the society, the retention method that recorded the human activity is changing too.

Prerequisite II: The record and cognition of human history is restricted by the information processing pattern (D)

- **Film technology put voice, picture, characters three message content together, try, can show many pieces of resting consistent technology of picture sequentially through time axis, solve traditional information processing way difficult connect and conversion such an problem of space-time that reflect.**

The time montage of 4-lens

FILM

≠

Real SPACE-TIME

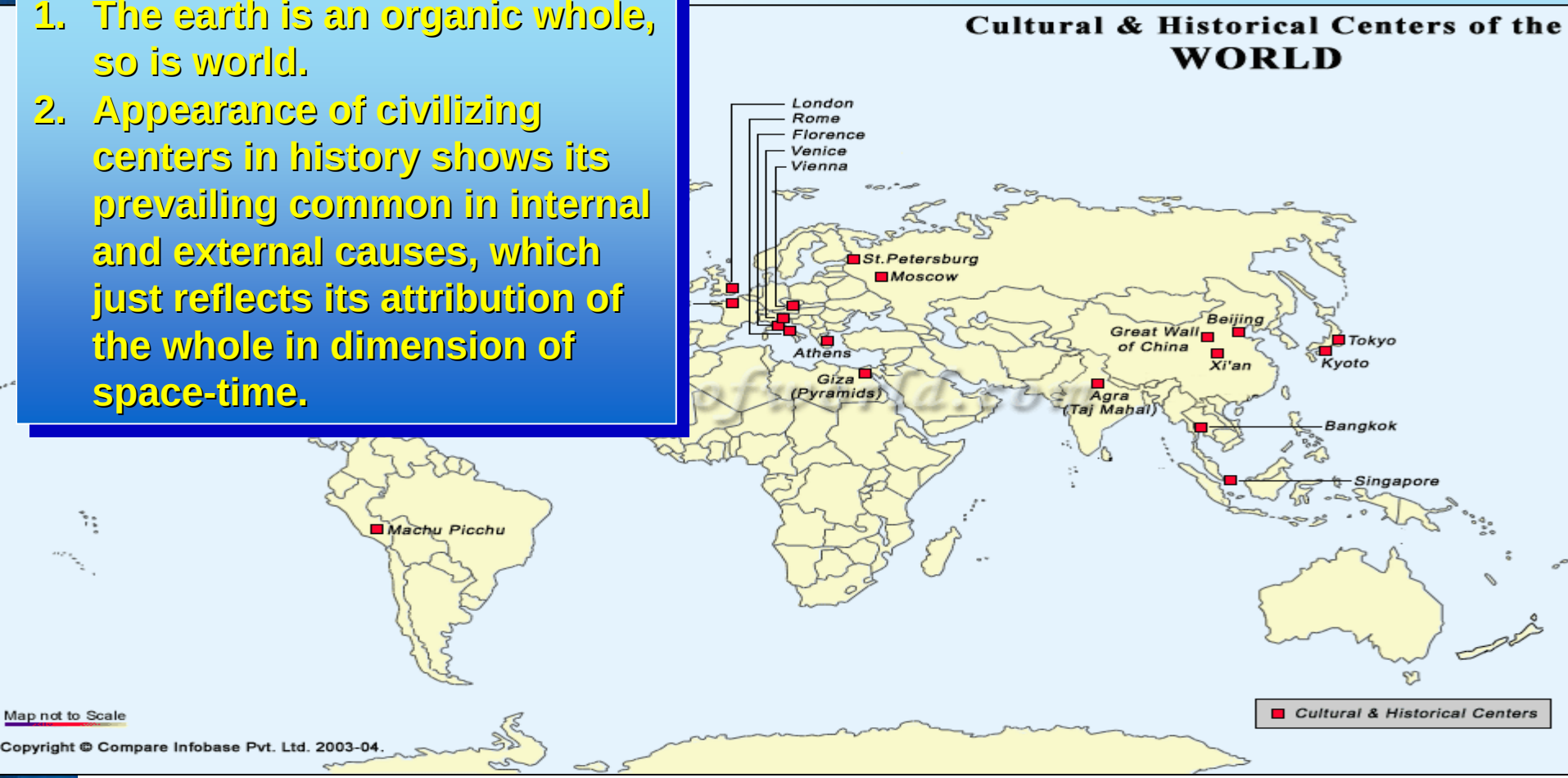
False 3D or 4D

The space montage of 12-lens

- **But, before beginning in contemporary informatization process, the human activity records the method and retains the way and still can not be well solved history and stated with the inherent old contradiction between true space-time.**

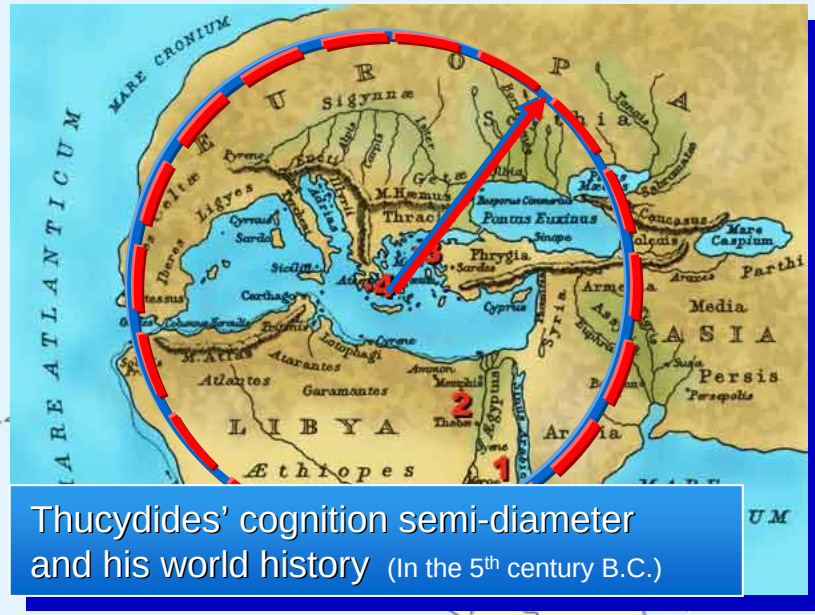
Prerequisite III: The world history discipline has unique information attribute (A_1)

1. The earth is an organic whole, so is world.
2. Appearance of civilizing centers in history shows its prevailing common in internal and external causes, which just reflects its attribution of the whole in dimension of space-time.



- The characteristic of World History on the object view (1), which is a comprehensive history on the whole from a view in dimension of space.

Prerequisite III: The world history discipline has unique information attribute (A_2)

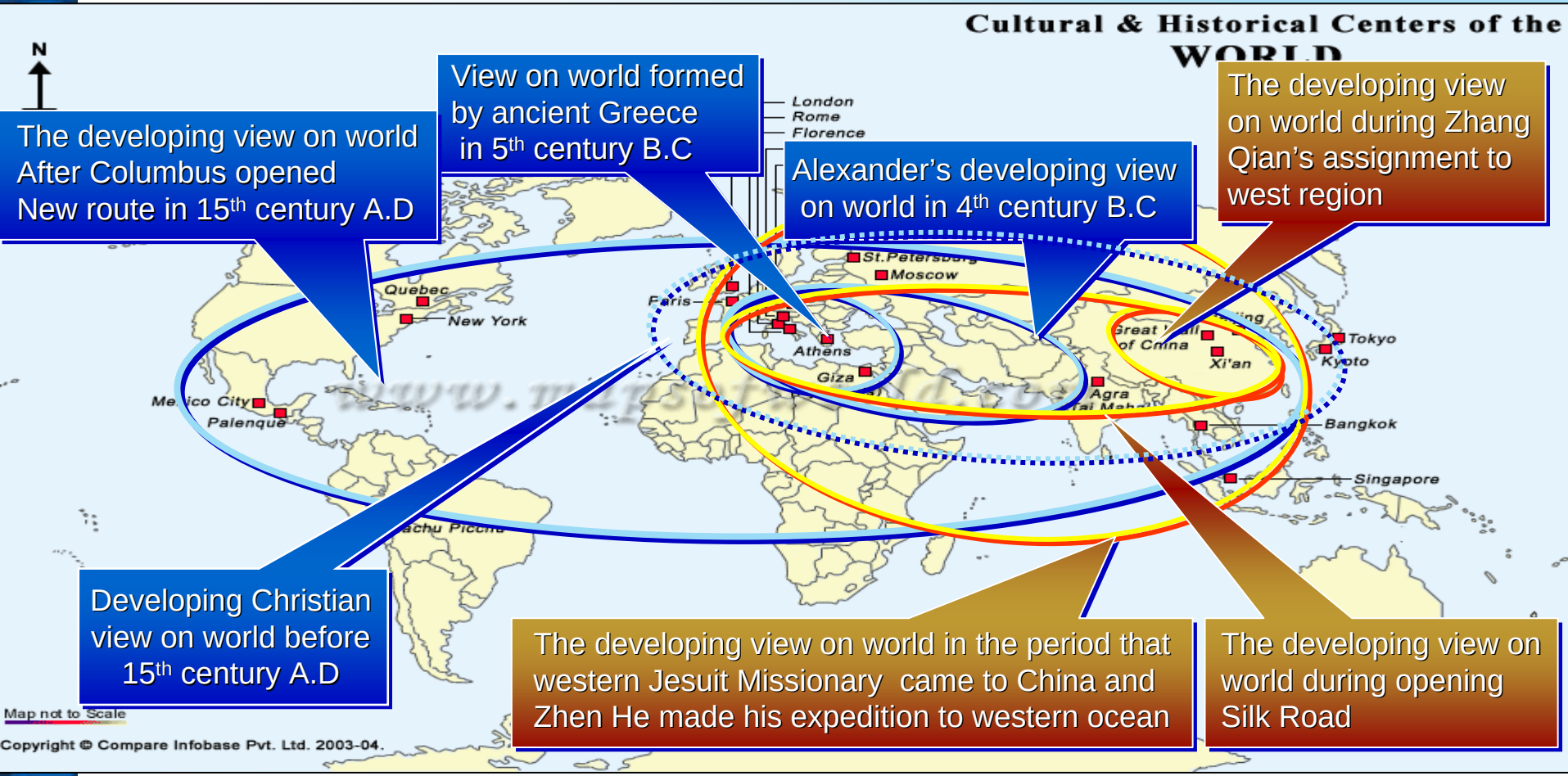


Thucydides' cognition semi-diameter and his world history (In the 5th century B.C.)

The world history of Confucius in *Spring and Autumn*

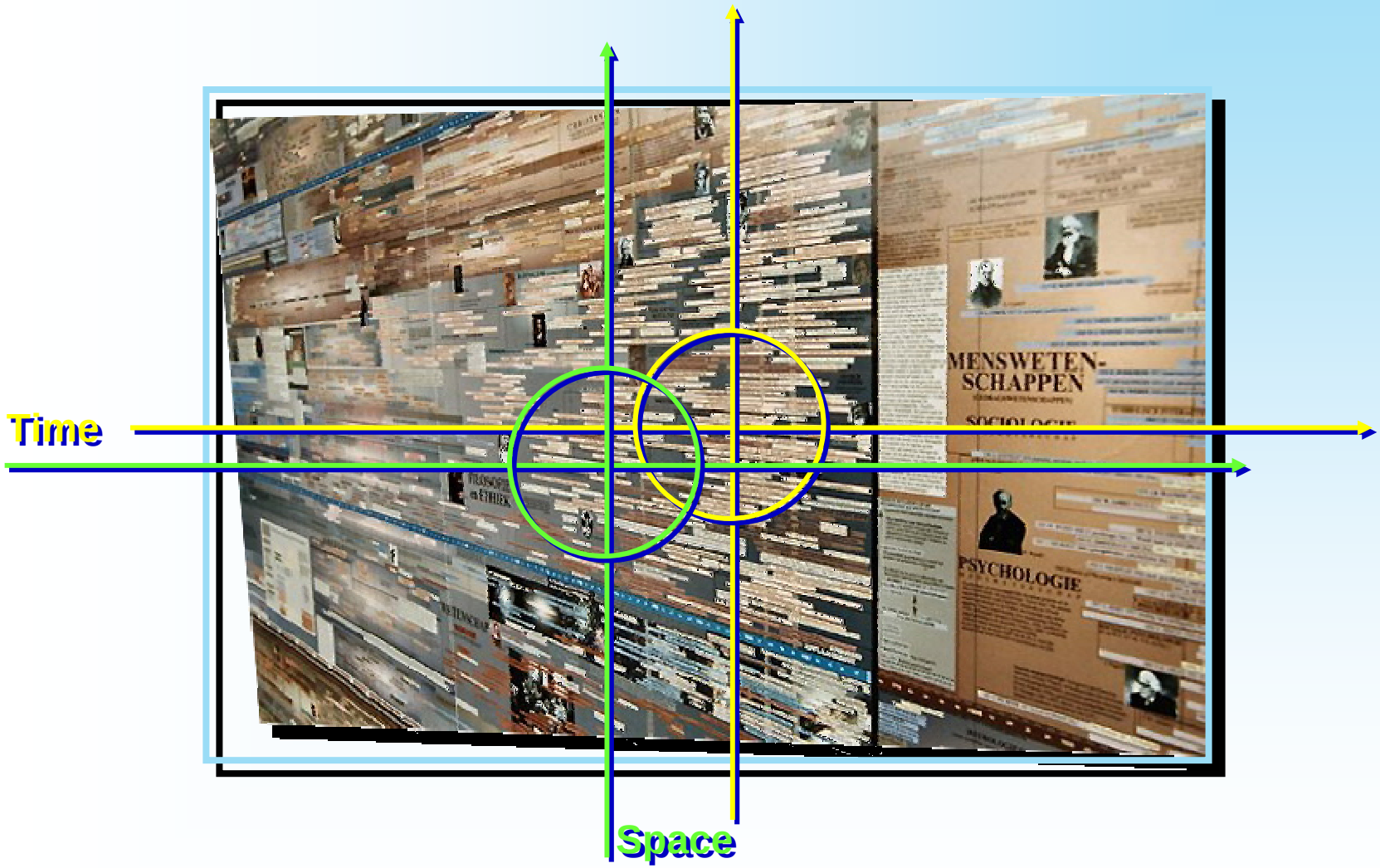
The characteristic of World History on the object view (1), which the realization and narration to World History is restricted by one's cognition semi-diameter from a view in dimension of space.

Prerequisite III: The world history discipline has unique information attribute (A_3)



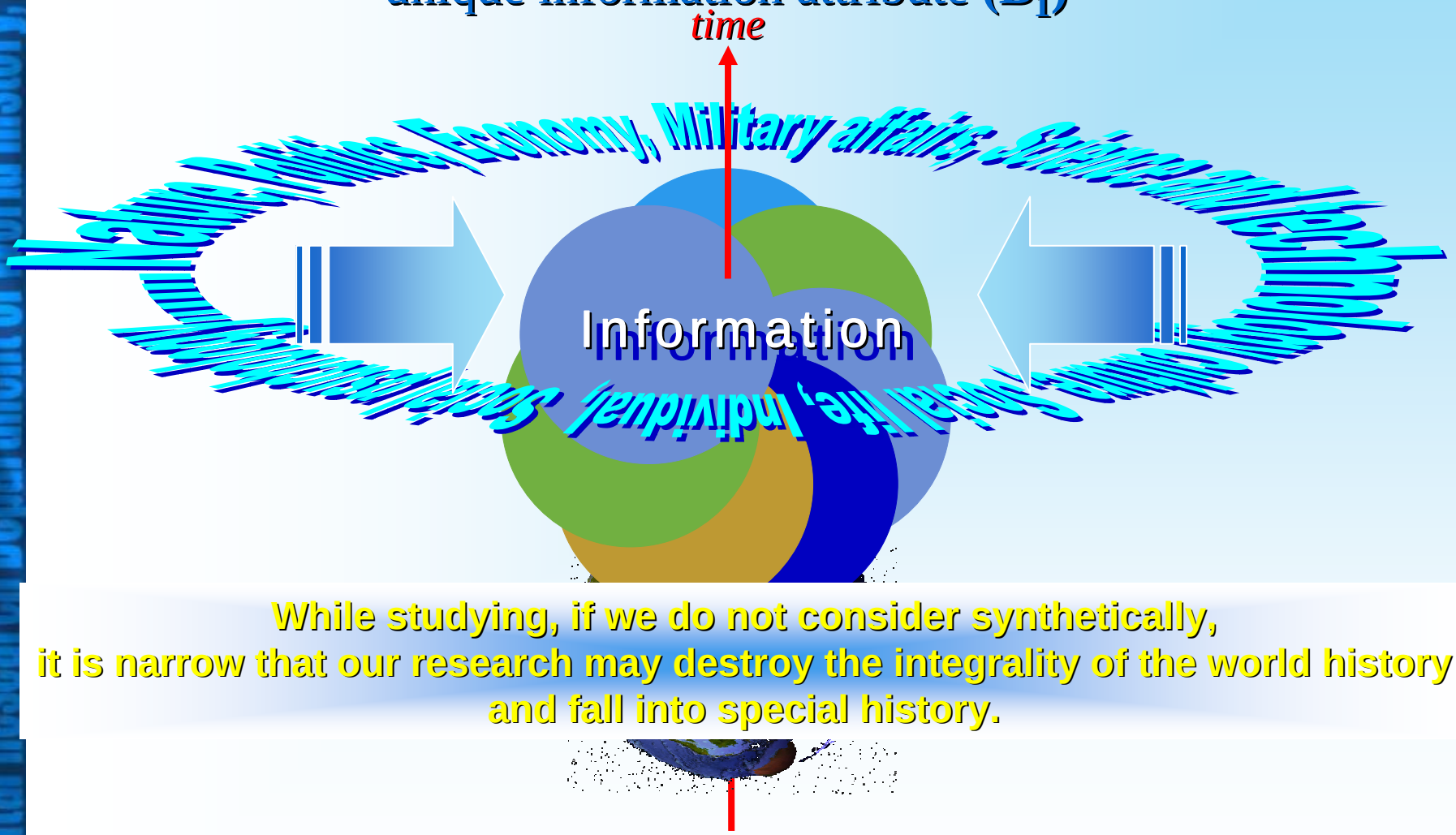
- **The characteristic of World History on the object view (1) : In the space size —— Enlarging the knowledge radius influenced human cognition of "world history" directly, from 1500 A.D, the view on world history space in the modern meaning had appeared.**

Prerequisite III: The world history discipline has unique information attribute (A_4)



- **The characteristic of World History on the object view (2) : From the time size —— A history of many threads in a disorder in dimension of time.**

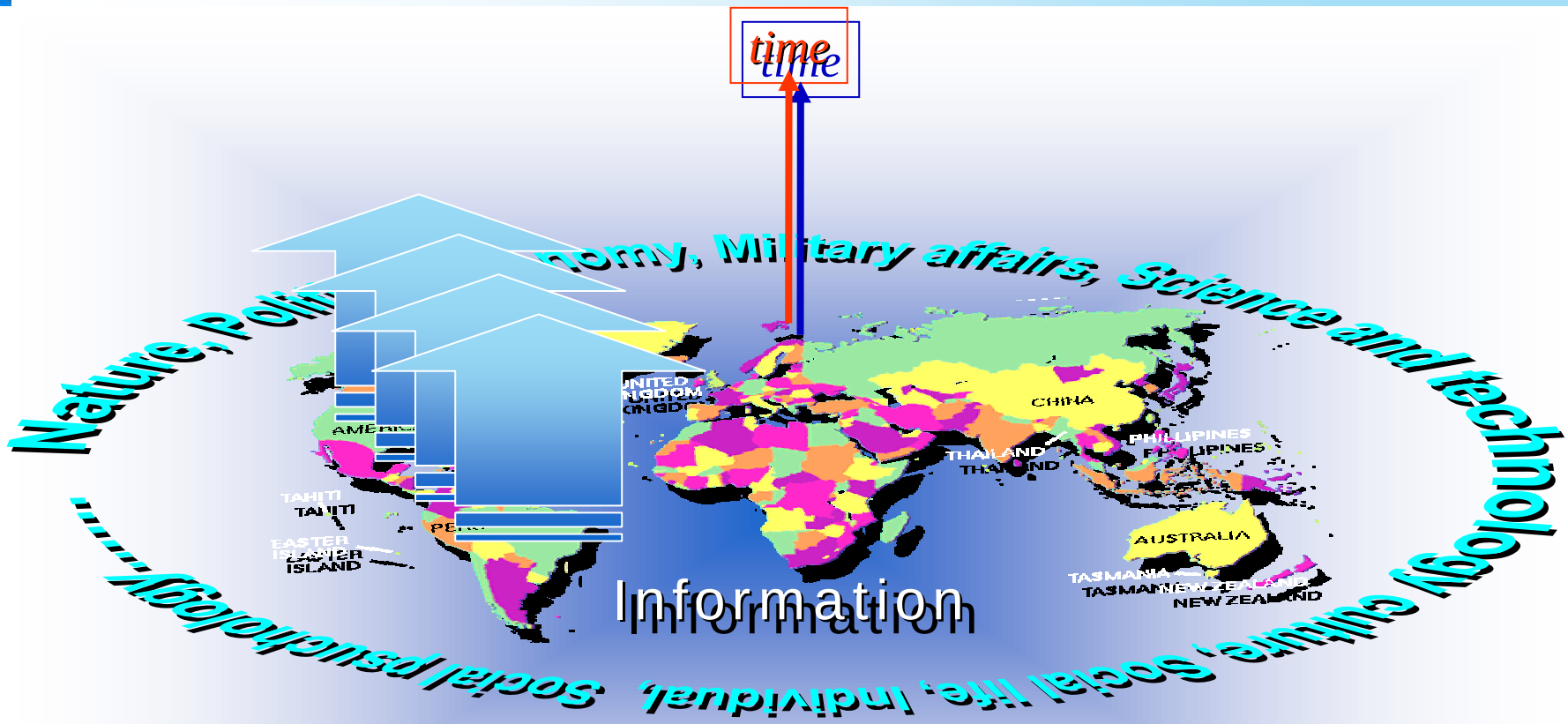
Prerequisite III: The world history discipline has unique information attribute (B_1)



While studying, if we do not consider synthetically,
it is narrow that our research may destroy the integrality of the world history
and fall into special history.

- **One of the informational attributions of World History:** Multi-combinations of information**, which has distinct and interactional information that exists in nature, politics, economy, military science, technology, culture, social life, individuals and community mentality.**

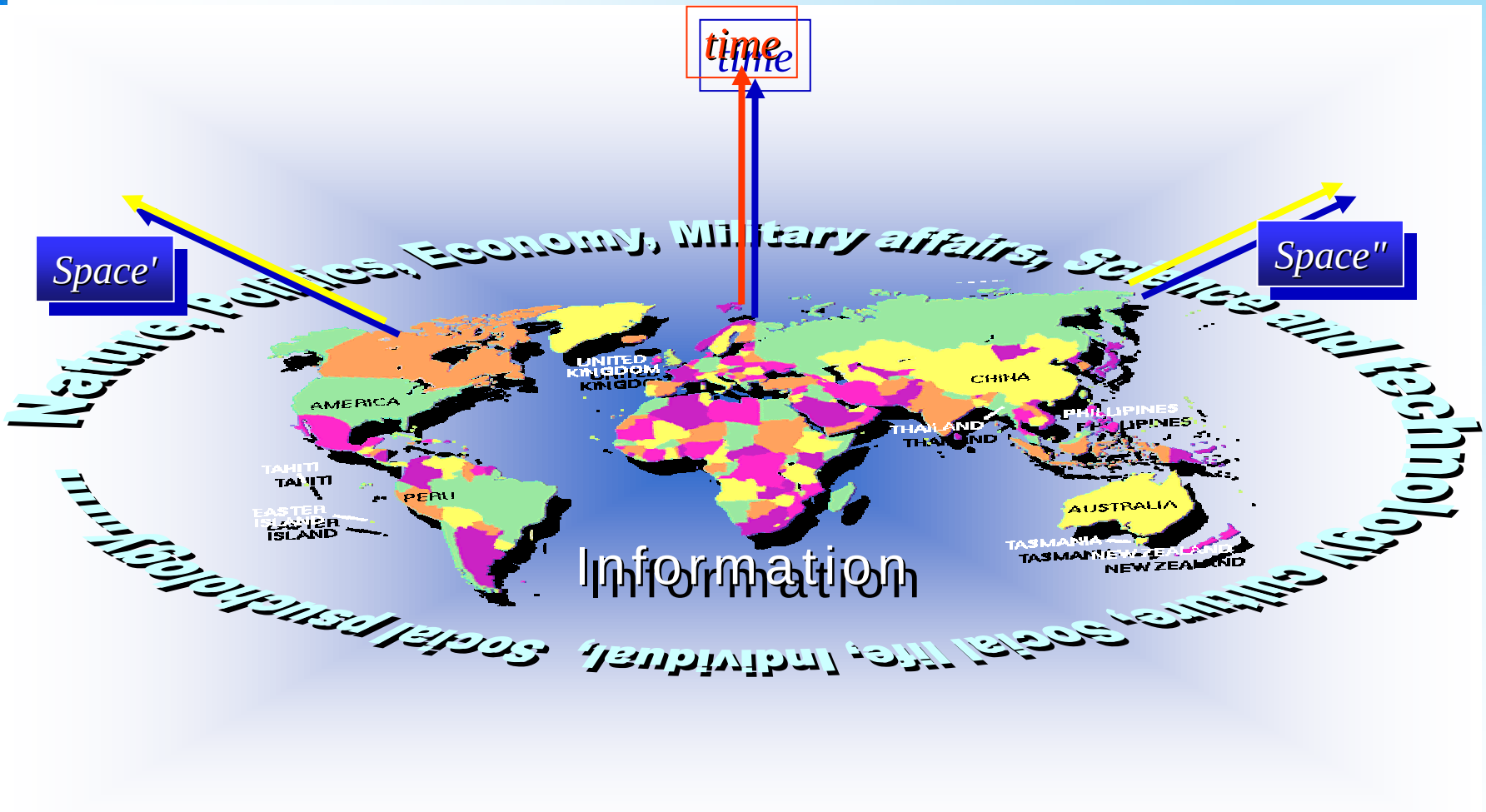
Prerequisite III: The world history discipline has unique information attribute (B_2)



It is necessary to give a thought to the information referred to local historical changes in every area or country.

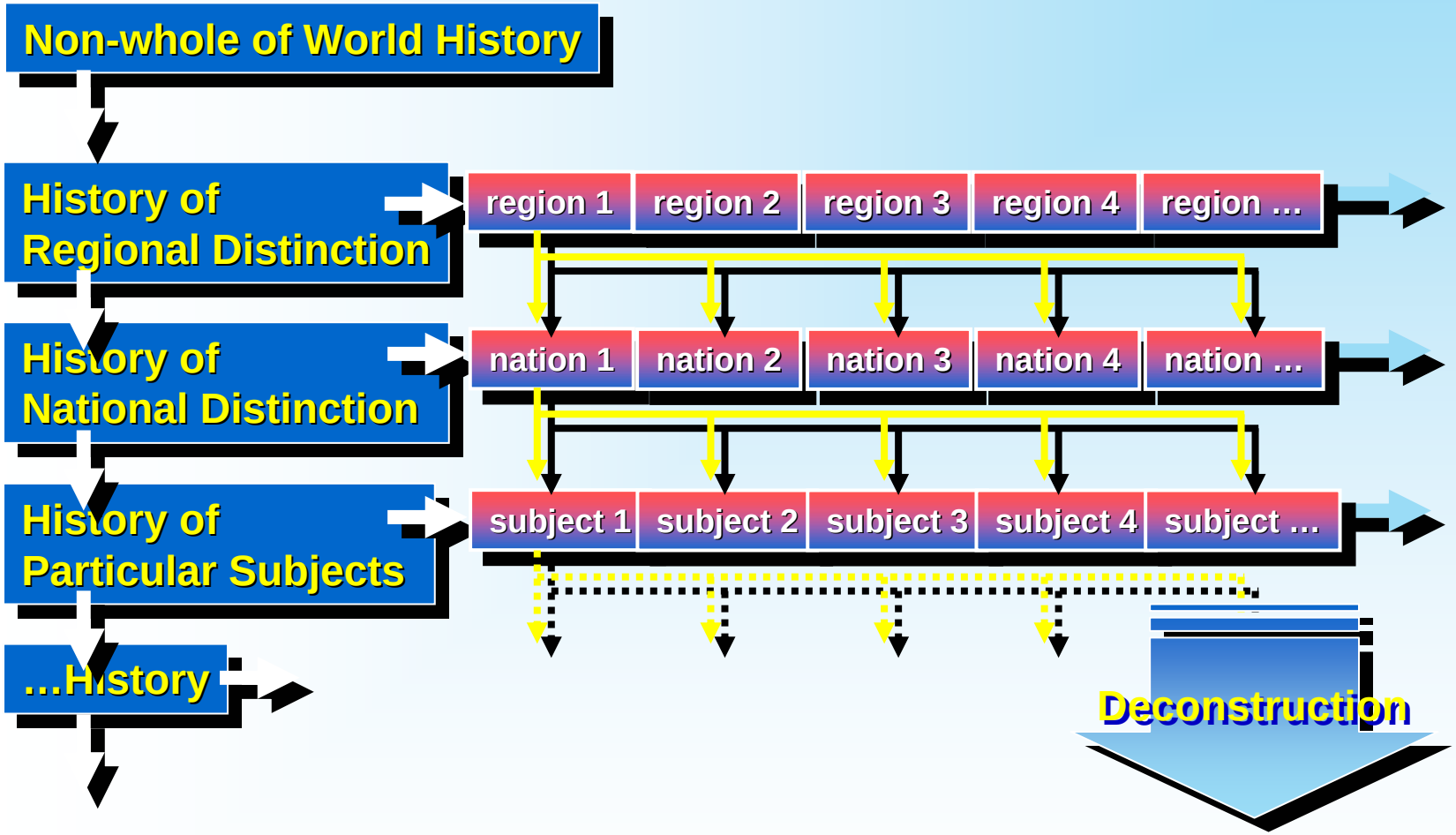
- **One of the informational attributions of World History:** Information distribution in multi-access**, all the information exits in different country or area at the either same time or different time.**

Prerequisite III: The world history discipline has unique information attribute (B_3)



- **One of the informational attributions of World History: Information assembled in multi-dimensions, which refers that any researchable historical information has its own coordinate in historical space-time and interacts with the information in multi-access, so as to result in information assembled in multi-dimensions.**

Prerequisite III: The world history discipline has unique information attribute (C_1)

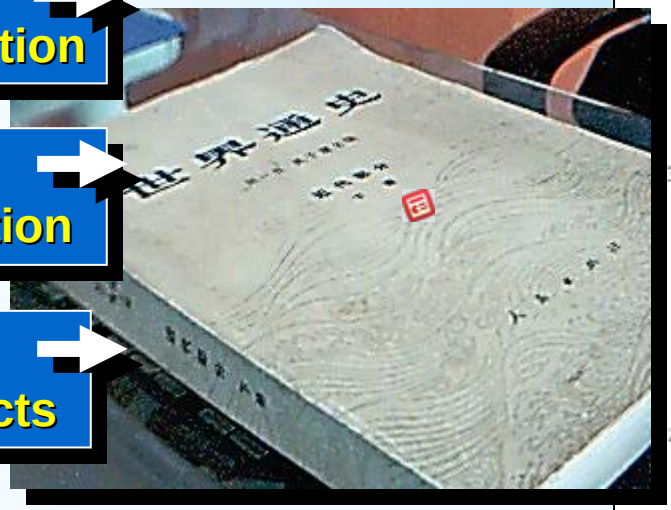


- **The case in deconstructive phenomena of non-whole of historical discipline**
  - **Historical roots : Diachronic quality of natural language, a restriction to the retrieve of space-time in history narration.**

Prerequisite III: The world history discipline has unique information attribute (C_2)

Non-whole of World History

- **History of Regional Distinction**
- **History of National Distinction**
- **History of Particular Subjects**
- **…History**



General History of World

Zhou Yiliang / Wu Yujin

1962

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- **The case in deconstructive phenomena of non-whole of historical subject (1): Diachronic quality of natural language, a restriction to the retrieve of space-time in history narration.**

Prerequisite III: The world history discipline has unique information attribute (C_3)

Non-whole of World History

History of Regional Distinction

History of National Distinction

History of Particular Subjects

…History

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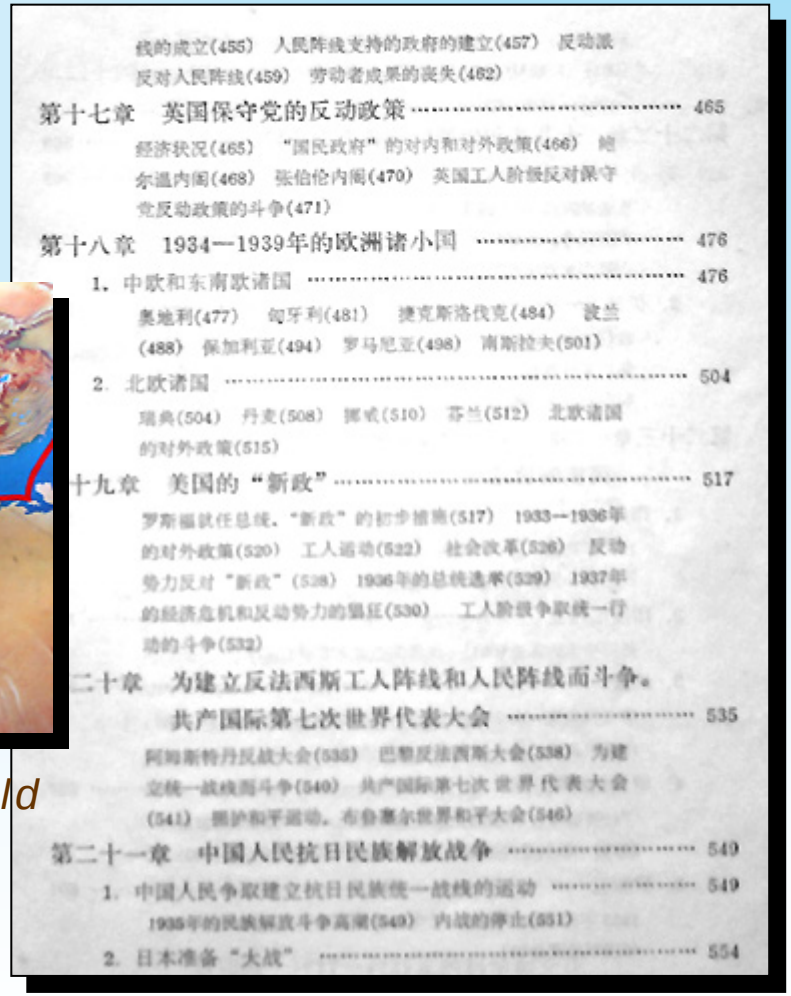
USSR Academy of Sciences
1962

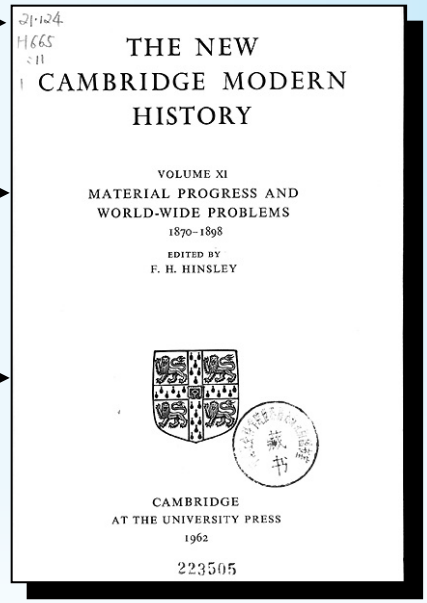


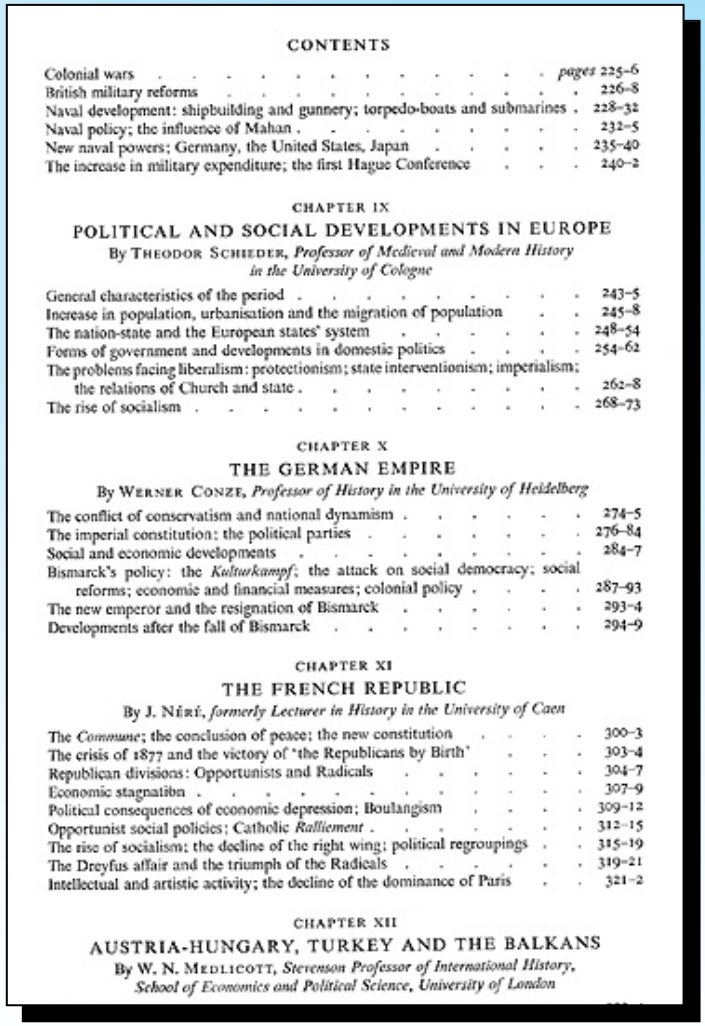
- **The case in deconstructive phenomena of non-whole of historical subject (2): Diachronic quality of natural language, a restriction to the retrieve of space-time in history narration.**

Prerequisite III: The world history discipline has unique information attribute (C_4)

Non-whole of World History

- **History of Regional Distinction**
- **History of National Distinction**
- **History of Particular Subjects**
- **…History**





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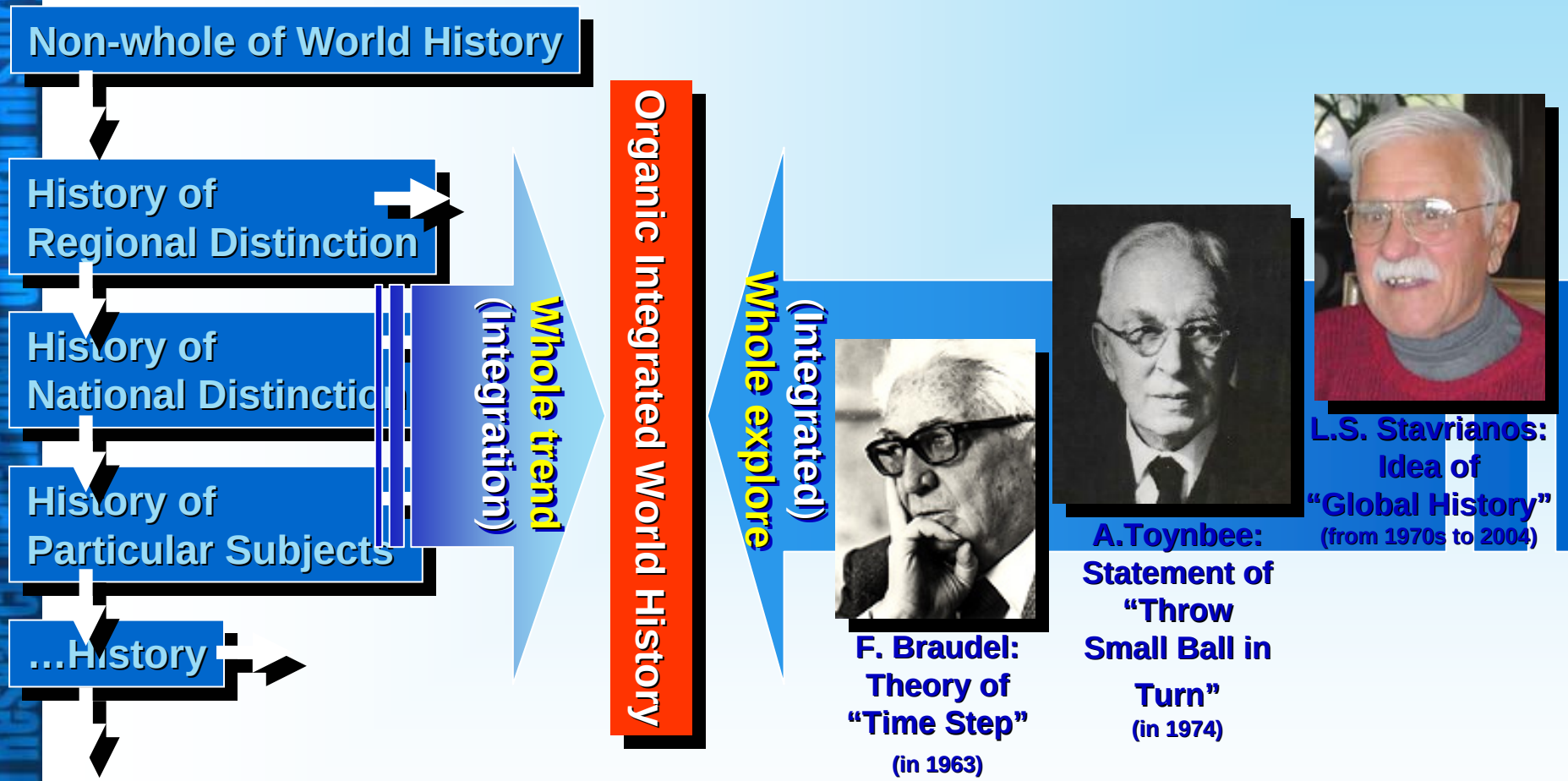
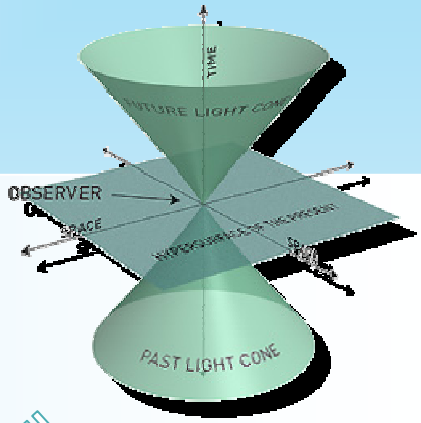
- **The case in deconstructive phenomena of non-whole of historical subject (3): Diachronic quality of natural language, a restriction to the retrieve of space-time in history narration.**

Prerequisite III: The world history discipline has unique information attribute (D_1)

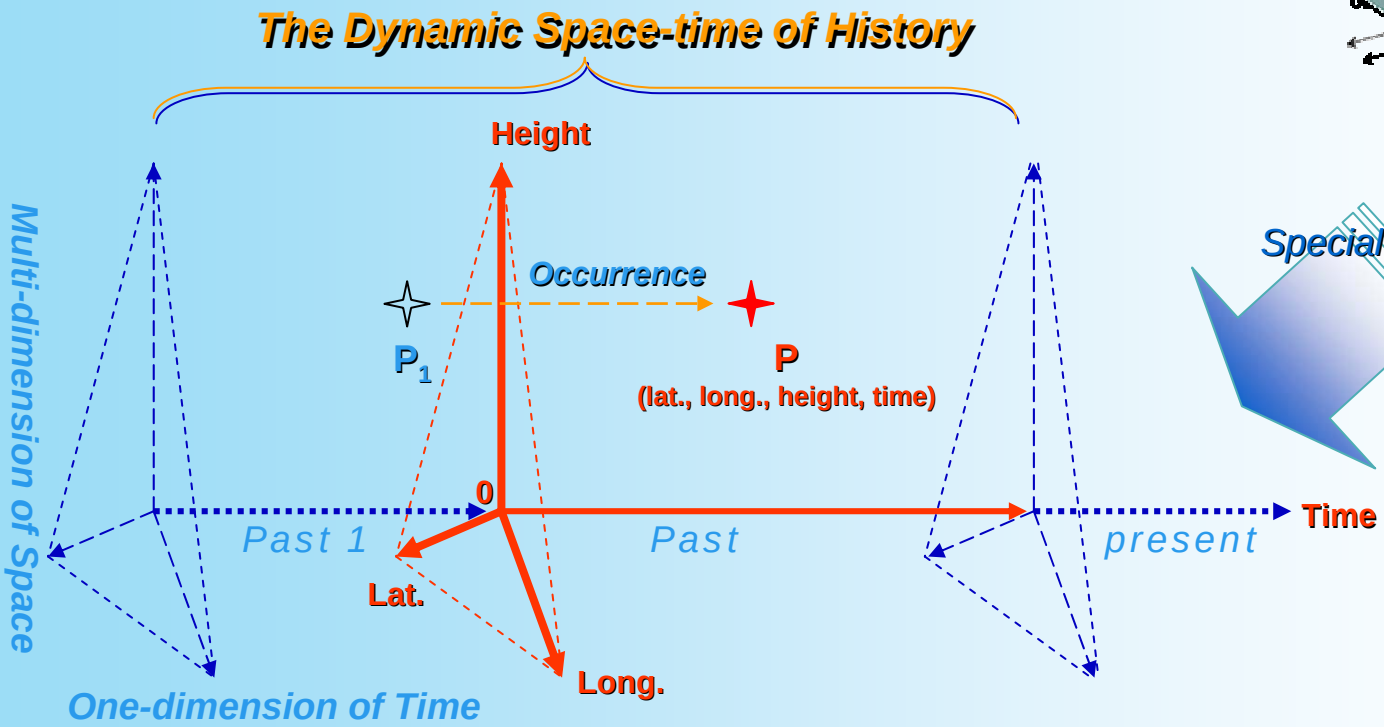


- **Adverse movement of deconstructive phenomena of non-whole of historical subject (1): Try to shake off the lasting limitation of the natural language, reflect the space-time of history structure objectively.**

Prerequisite III: The world history discipline has unique information attribute (D_2)



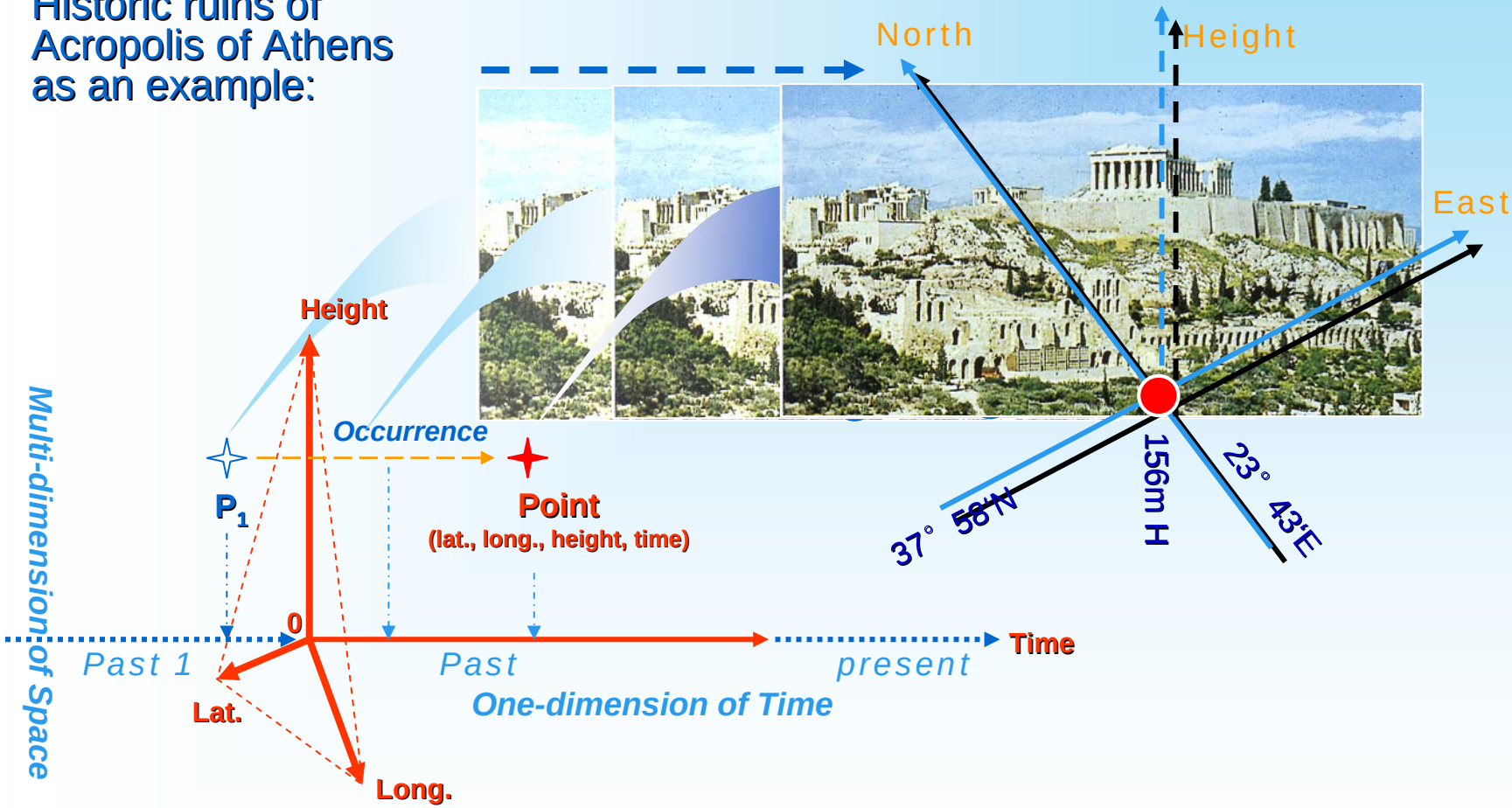
Special Theory of Relativity



- **Adverse movement of deconstructive phenomena of non-whole of historical subject (1): Bringing in the theory of nature science, constructing dynamic historical space-time.**

Prerequisite III: The world history discipline has unique information attribute (D_3)

- Historic ruins of Acropolis of Athens as an example:



Model of the dynamic space-time of history VS. Real World

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  – Three, the world history discipline has unique information attribute.
- Paradigm Definition:

  Concept, framework elements and methodological principle

  – What's the Digital World History?

  – The composition of framework elements?

  – What methodology principles are there?

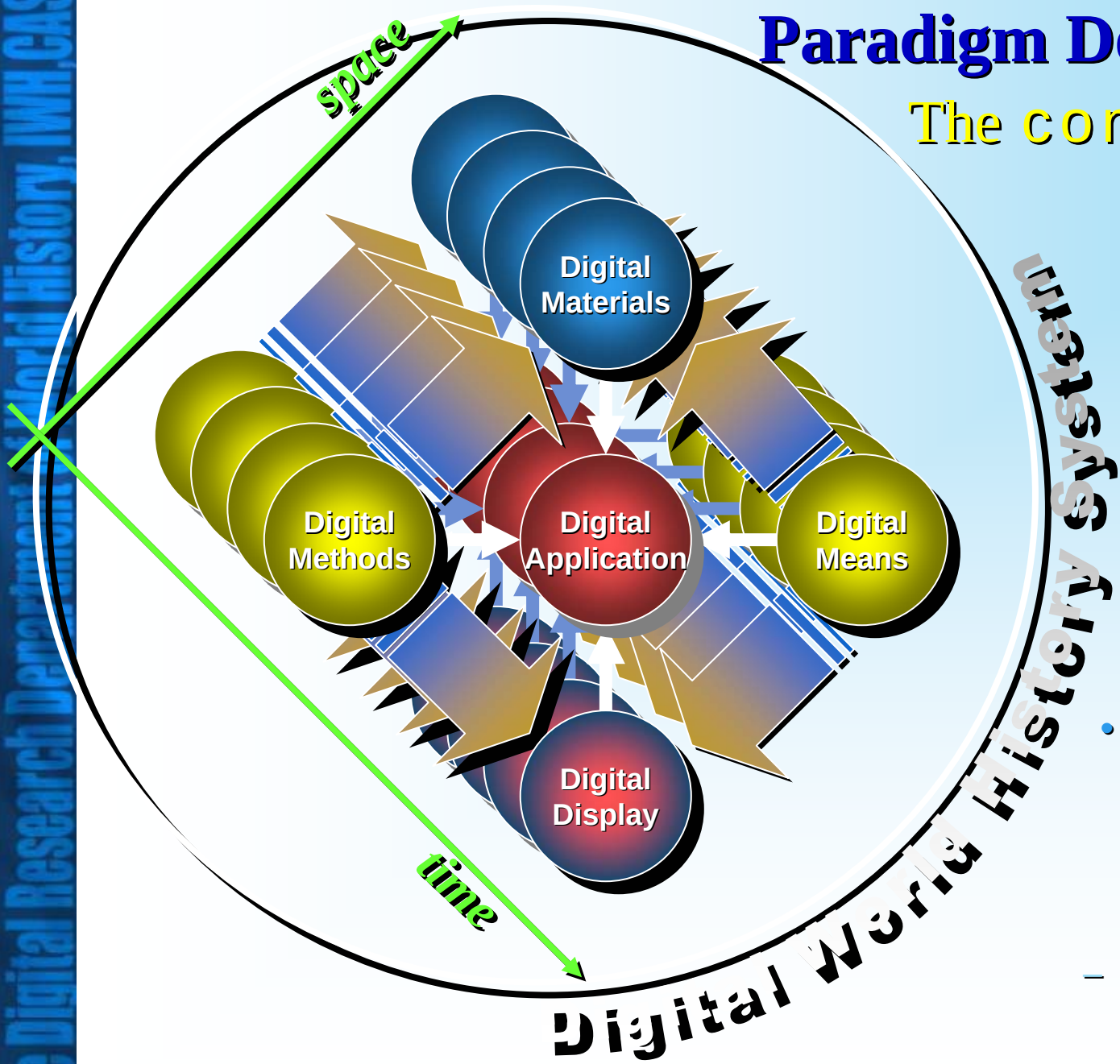
Paradigm Definition (A):

Concept --What's the Digital World History ?

- Digital World History is not number history but an organic combination of digital history and informationalized historical research.
- **Definition of the Digital World History: The digital world history is a brand new paradigm in which studies world history on a 1)specific informatization technological platform from 2)information angle. This paradigm gives a 3)dynamic mark, integrated description and retrieve on a global scale to the historical evolution of human society and its relevant causality, which 4)acquired achievements can be used in integration, depending on 5)the theory and methodology of digitization and informatization based on 6)the principle of historical research.**
- Target: It aims at associations and fusions among the factors in the changing history as well as the results of all sorts of historical research to meet the needs of an information-equipped society in the 21st century.

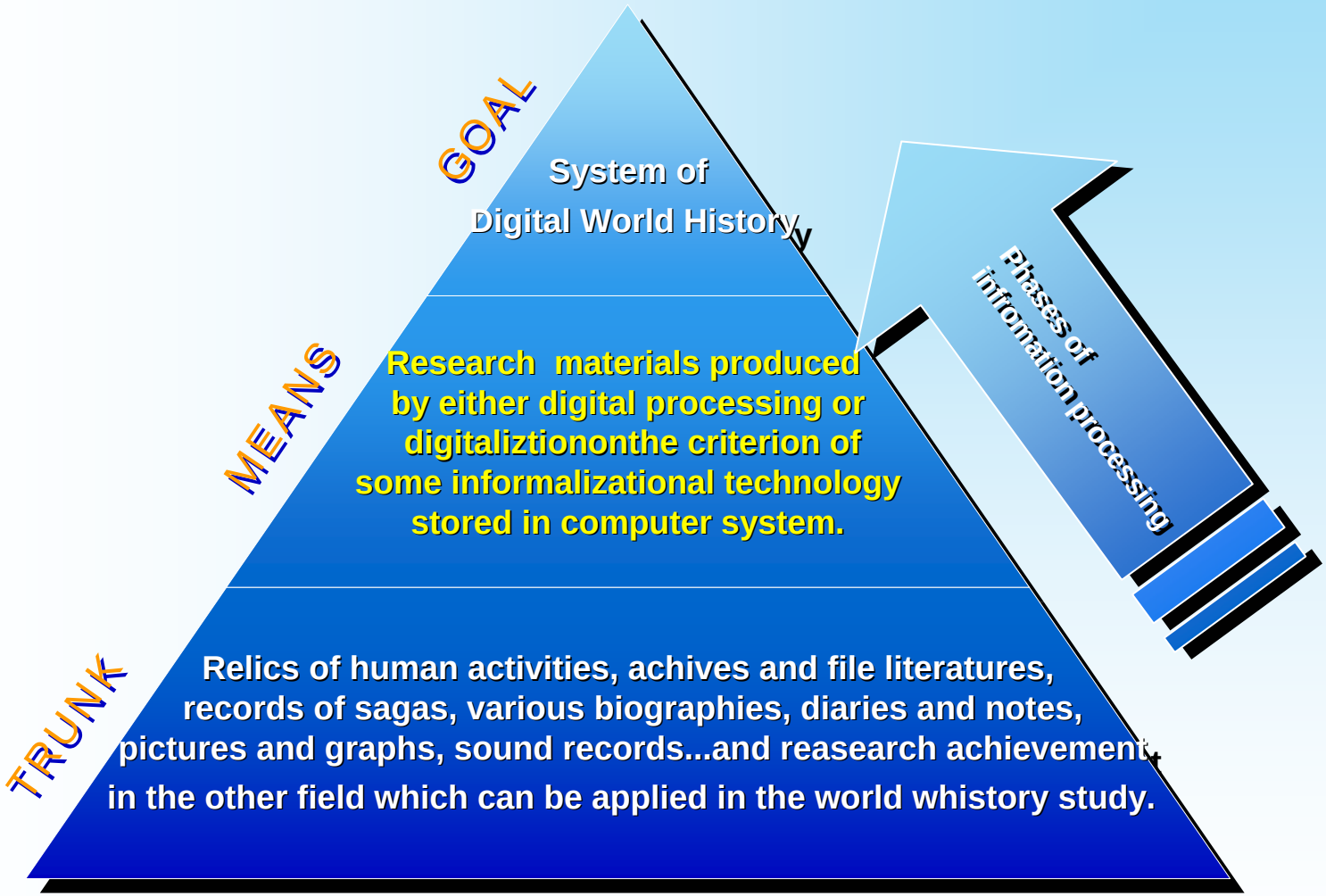
Paradigm Definition (B):

The composition of framework elements?



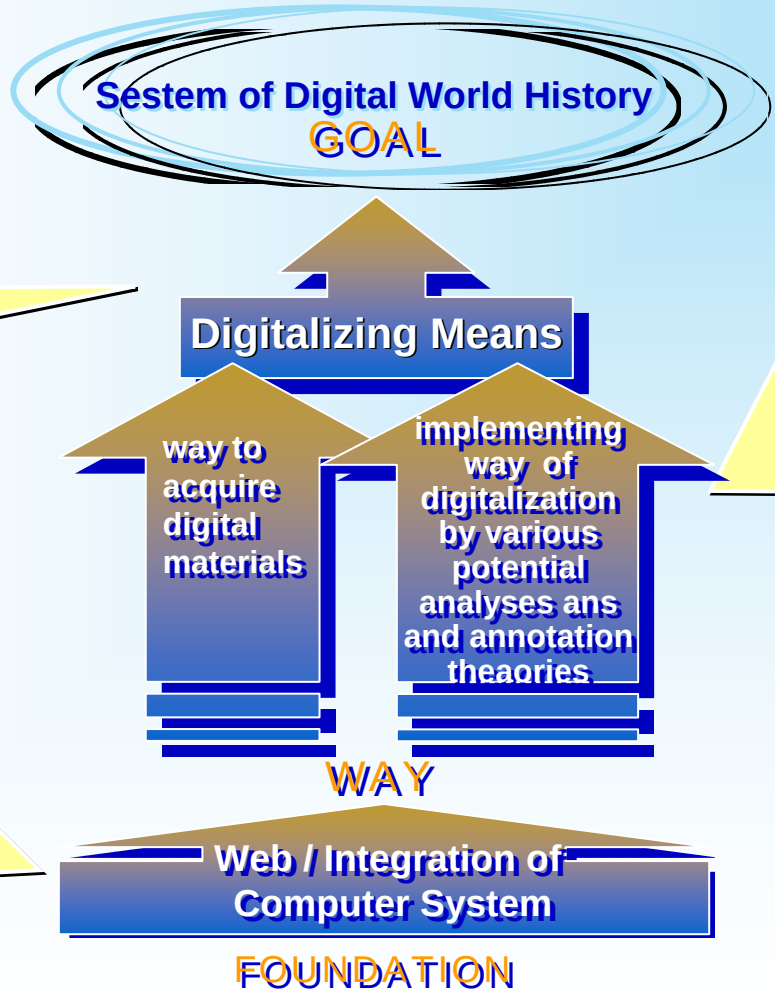
- **Bsic Components**
  - **1) Digital Materials**
  - **2) Digital Means**
  - **3) Digital Methods**
  - **4) Digital Display**
  - **5) Digital Application**

Paradigm Definition (B_1):
Digital Materials



- One of key systematic parts for paradigm of digital world history: Digital materials

Paradigm Definition (B_2): Digital Method and Means



Digital way can be realized only by digital means.

Operation of digital method and means relies on the technical support by computer system even by integrated computer system built on connection of Internet.

It will be digitalized for the various potential analyses and annotation theories for world history study, such as statistical analyses for historical materials themselves or directly for historical phenomena and situation, math modeling ,information theory, cybernetics, systematic theory…

- One of key systematic parts for paradigm of digital world history: Digital method and means

Paradigm Definition (B_3): Digital Display

- Referring to **a format of digitalization display** on each part of achievement in world history.

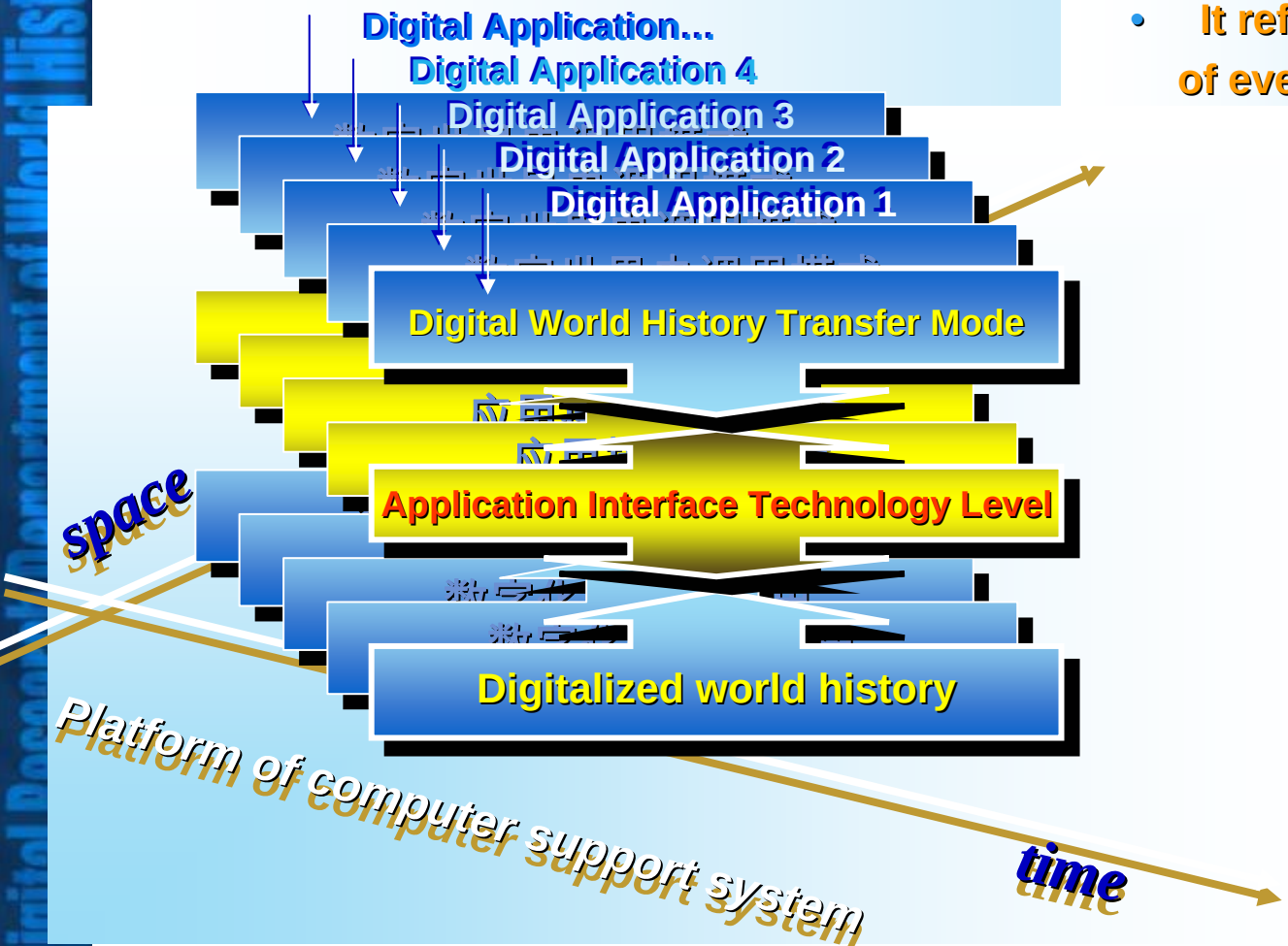
Display of relationship in every level depends on connecting and annotating by the digitized methods

- the **rational association** of each achievement under the guidance of **systematic theory**.
- the **rational connection** works on the **cause and effect** between each achievement **to feedback reactions** under the guidance **of cybernetics**;
- **Method of statistical analysis**, to announce and describe each achievement **regularity of quantitative relation**;
- **Method of mathematics modeling**, to **excavate and value** the historical data and **predict key** element that might.
- contain of the all achievement etc.

- **Display of achievement itself on digital means above**
  - Display of text is transferred from OCR identifying to database storage and hypertext connection
  - Display of view , needs 2D/3D graphic modeling with CAD
  - if the achievement needs to strengthen its draft genuine by the sound or film, we must carry on more complicated multimedia technology.

- One of key systematic parts for paradigm of digital world history: Digital Display

Paradigm Definition (B_4):
Digital Application



- It refers to the transfer modes of every stages and every level ent which obtained in ing, constructing and ying the digital world history.

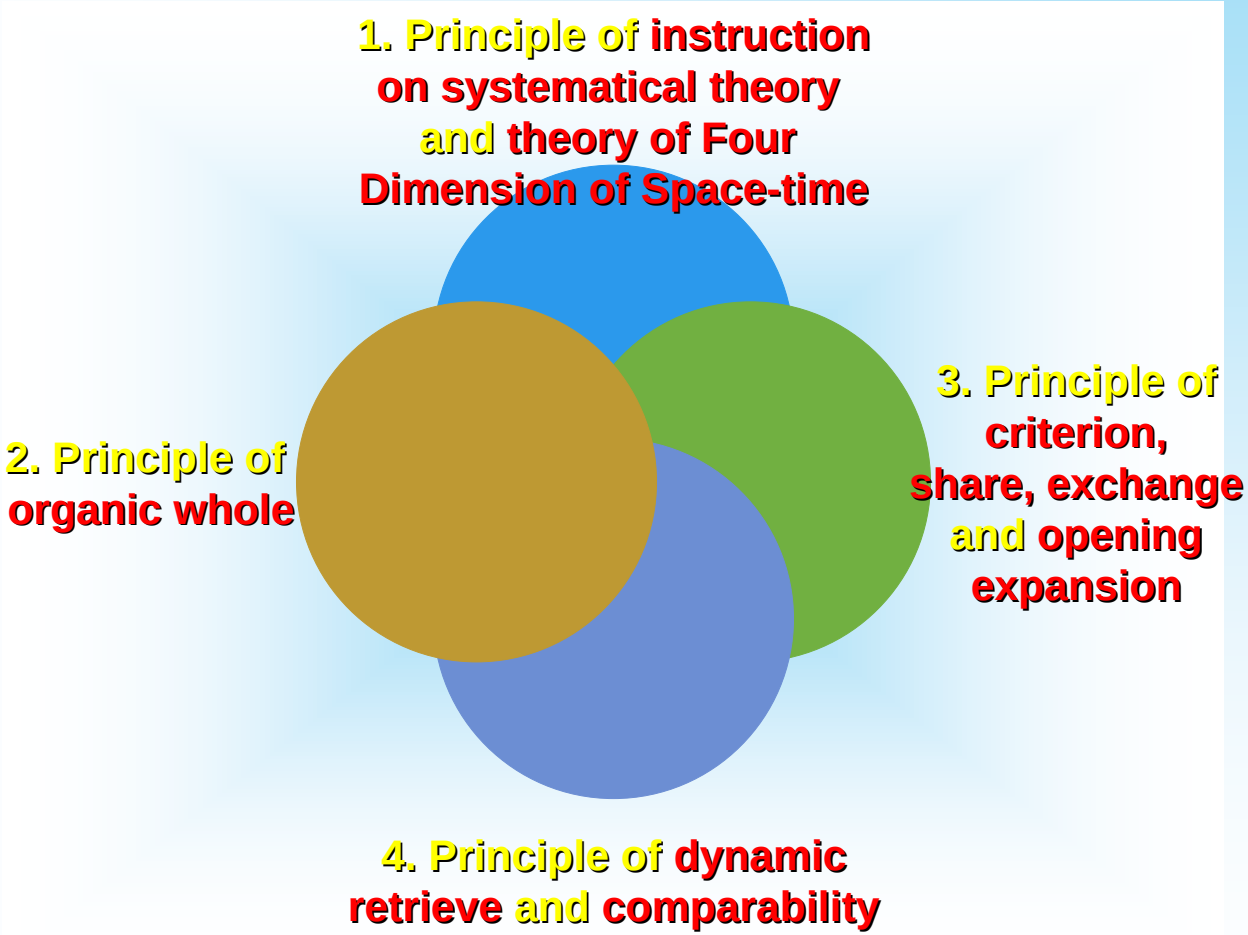
The transfer objects ubtedly pertain to the graphy content which ressed in digitization.

e best transfer of the nts is decided by the hoice and secondary velopment of display , which combined the ment with standard in digital world history.

- One of key systematic parts for paradigm of digital world history : digital application

Paradigm Definition (C):

What methodology principles are there?



- **The methodology principle in the digital world history paradigm**

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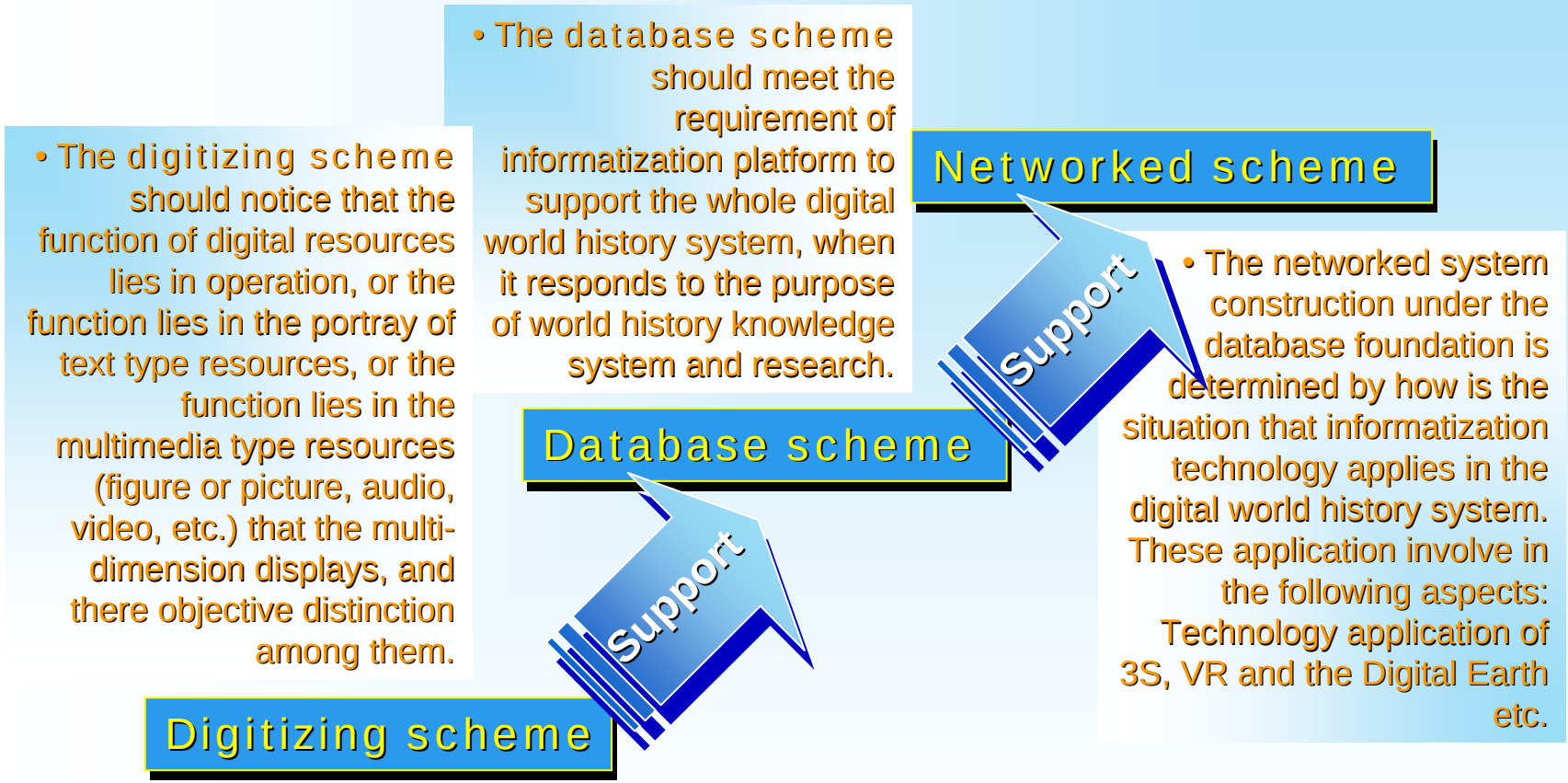
  Concept, framework elements and methodological principle
  - What's the digital world history?
  - The composition of framework elements?
  - What methodology principles are there?
- Scientific Data Strategy:
  Technology aspect, policy aspect and integration of system frame
  - Technological scheme aspect
  - Policy environment aspect
  - Integration of system frame

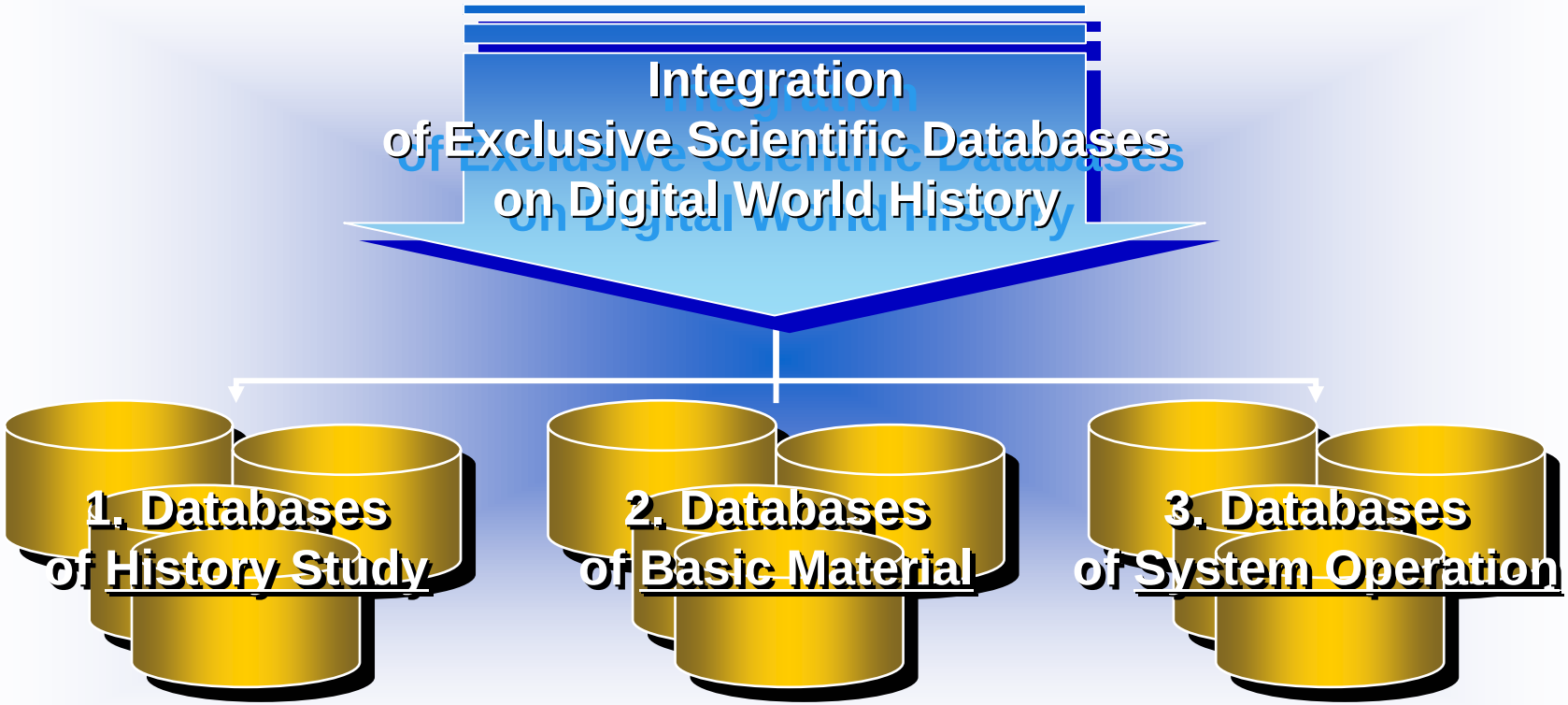
Scientific Data Strategy (A): Technological scheme aspect



- **Scientific Data Strategy: Technology aspect, policy aspect and integration of system frame**

Scientific Data Strategy (A):

Technological scheme aspect[1] ---- Database



- Scientific Data Strategy: Technology aspect, policy aspect and integration of system frame

Scientific Data Strategy (A):
Technological scheme aspect[1] ---- Database

- **Database of History Study:**

It mainly uses for structurization store on various historical data and research achievements at different stage during the world history study, so as to transfer Digital World History.

- **Sub-databases of Historical Materials**
  - It is classified as topics according to the category of historical subjects...
- **Sub-databases of Research Achievements**
  - It is classified as topics according to the category of research achievements...
- **Sub-database of index with relevant key elements**

Technological scheme aspect ---- Database: Exclusive scientific databases of Digital World History (1)

Scientific Data Strategy (A):
Technological scheme aspect[1] ---- Database

- **Database of Basic Materials:**

It mainly uses for offering all the complementary materials from nature, society and other fields during the world history study, so as to get the compared reference system from Digital World History.

- Sub-databases of natural environment and resources
- Sub-databases of nature scientific achievement
- Sub-databases of social environment and resources (non-history)
- Sub-databases of social scientific achievements (not history)
- Sub- database of index with relevant key elements

Scientific Data Strategy (A):
Technological scheme aspect[1] ---- Database

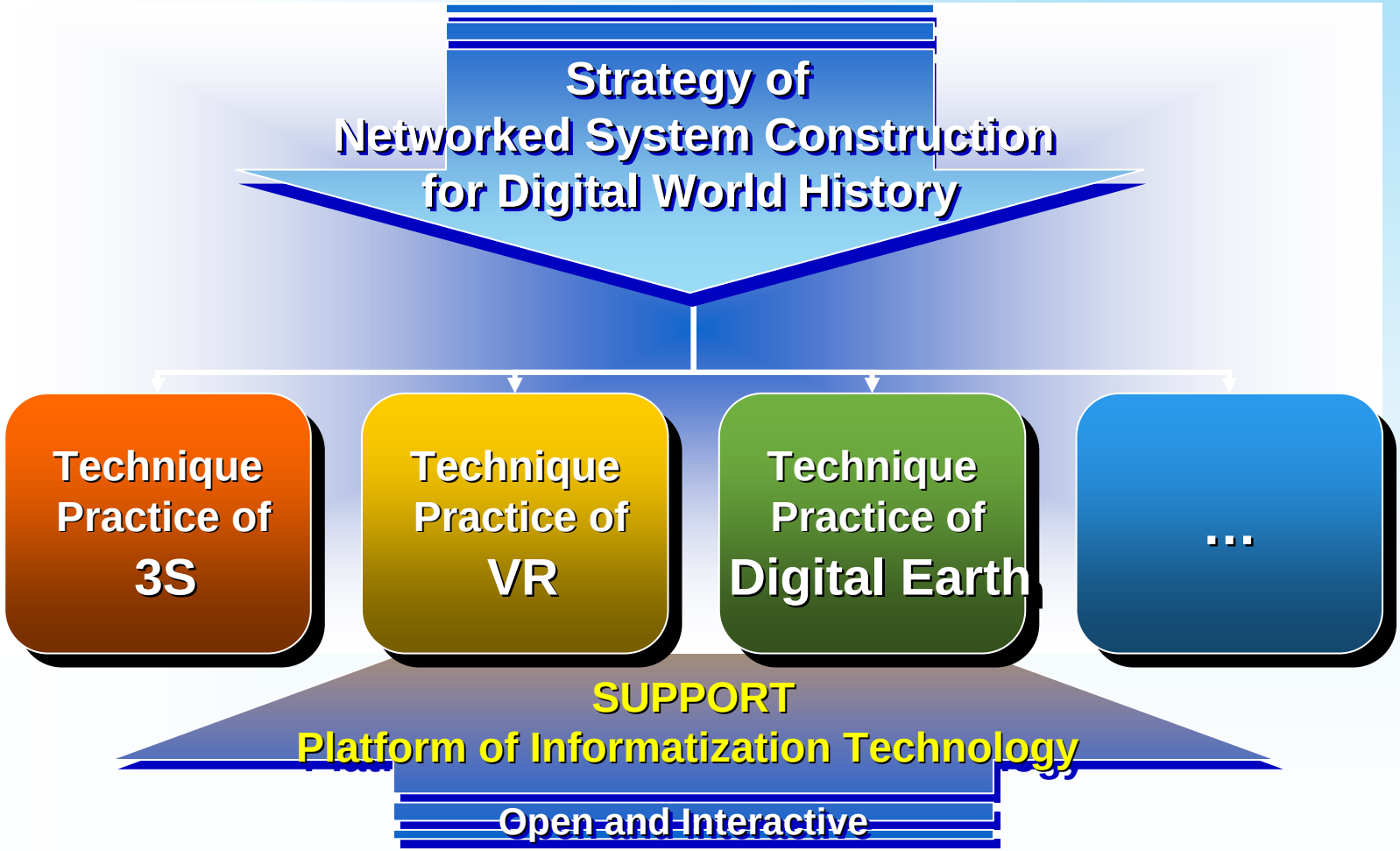
- **Database of Operating Basic System:**

It mainly uses for the normal operation of the open informatization technology on which Digital World History depends.

- **The set-up of this sub-database relies on the technical standard from relevant information technology**

Scientific Data Strategy (A):

Technological scheme aspect[2] ---- Networked

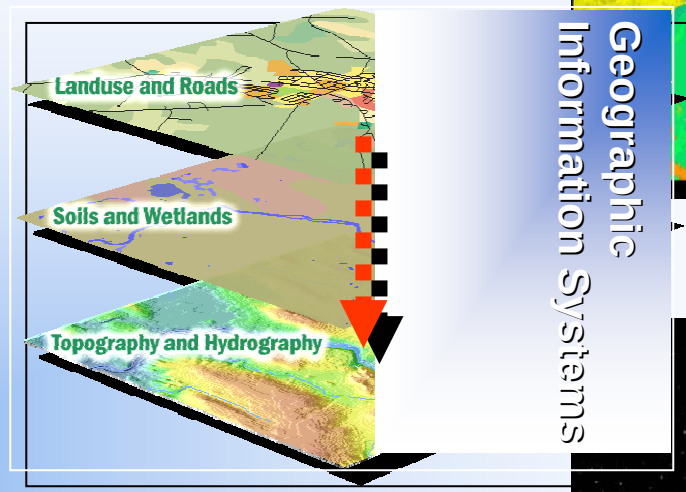


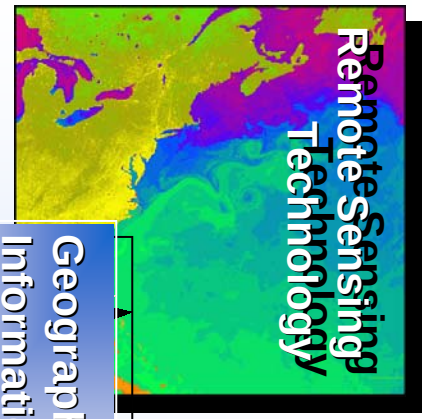
- Scientific Data Strategy: Technology aspect, policy aspect and integration of system frame

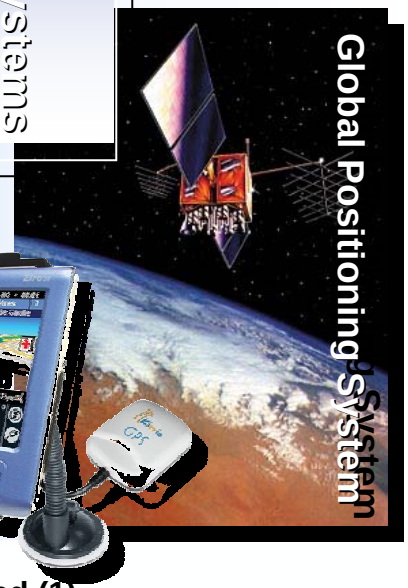
Scientific Data Strategy (A): Networked ---- 3S

It has predominance of real time, high speed and high precision for combination of information acquisition processing and application in one

It provides with the convenient integrated function of informatizational processing:
1) Timing adjusting to natural environmental information
2) Processing and display of overlapped content on the basis of timing location



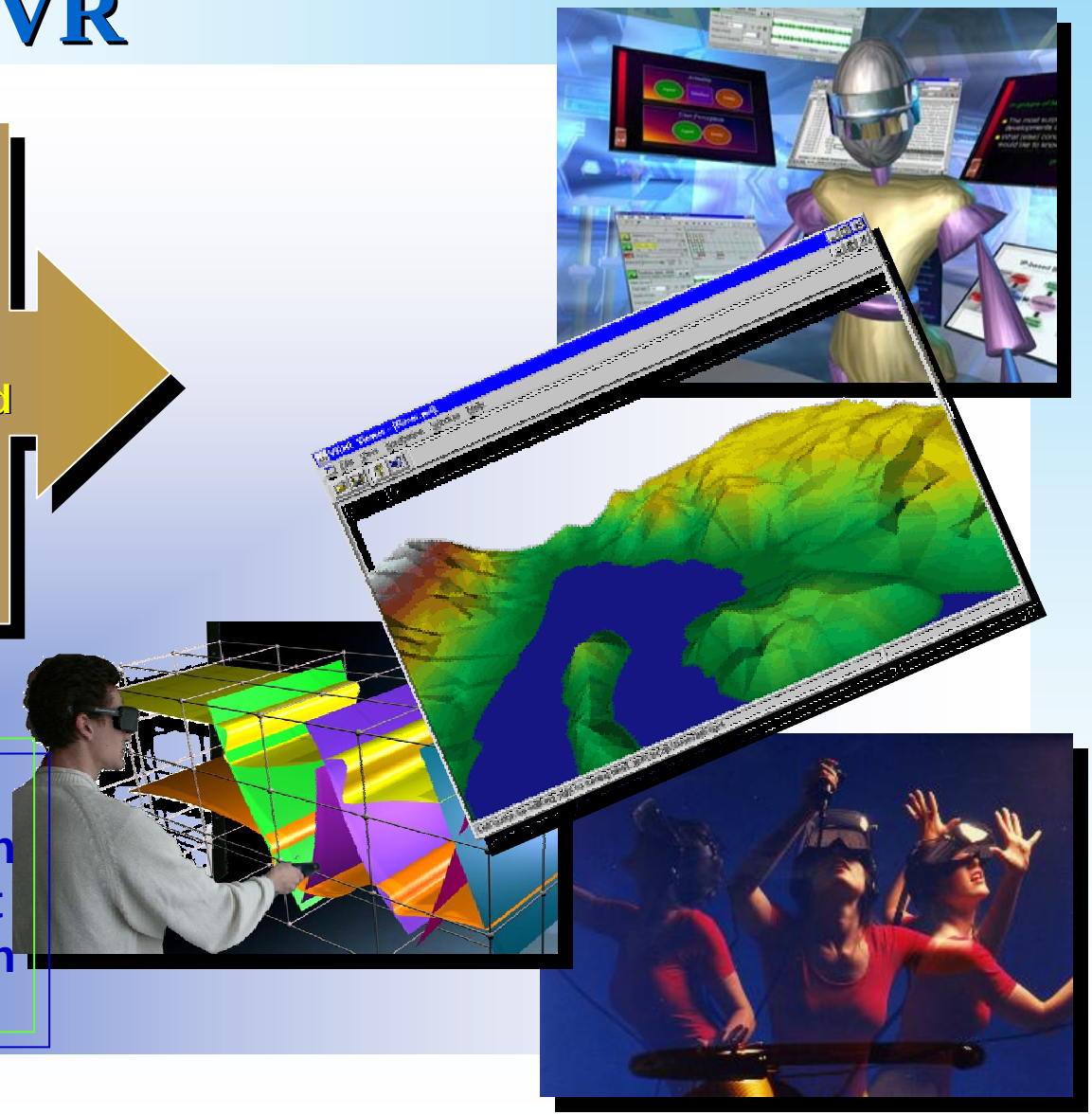




- Strategy of Networked System Construction for Digital World History: Networked (1)

Scientific Data Strategy (A): Networked ---- VR

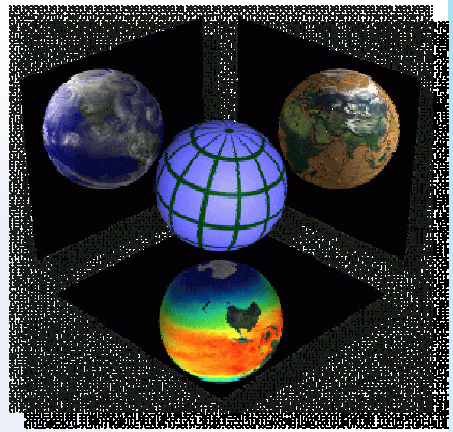
The VR technical application could make good use of recover corresponding historical elements and relation that closely related with human survival and development and facilitate to reproduce the fictitious historical process vividly.

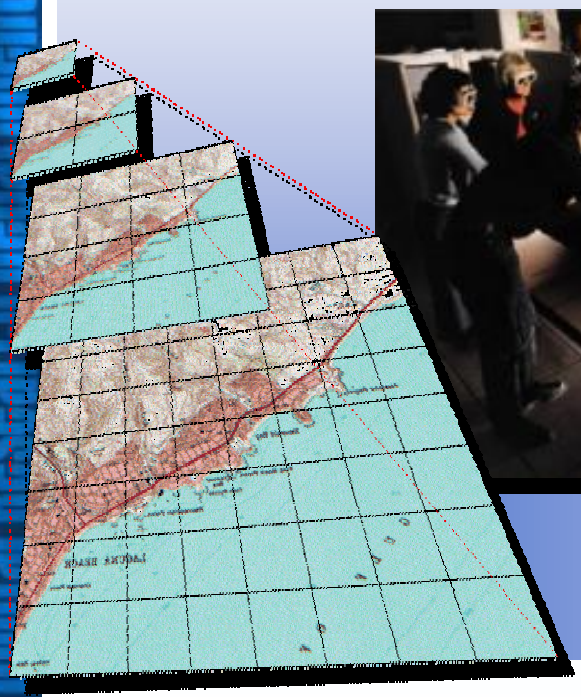


VR technical
1）fictitious application in the real environment
2）fictitious application in the virtual

Scientific Data Strategy (A): Networked ---- Digital Earth

Used in system of Digital World History, Digital Earth can make it realize multilayer and multi-resolving display, intelligent searches and transferring comprehensive comparable analyses and super emulation dynamic in four dimensions of space-time.





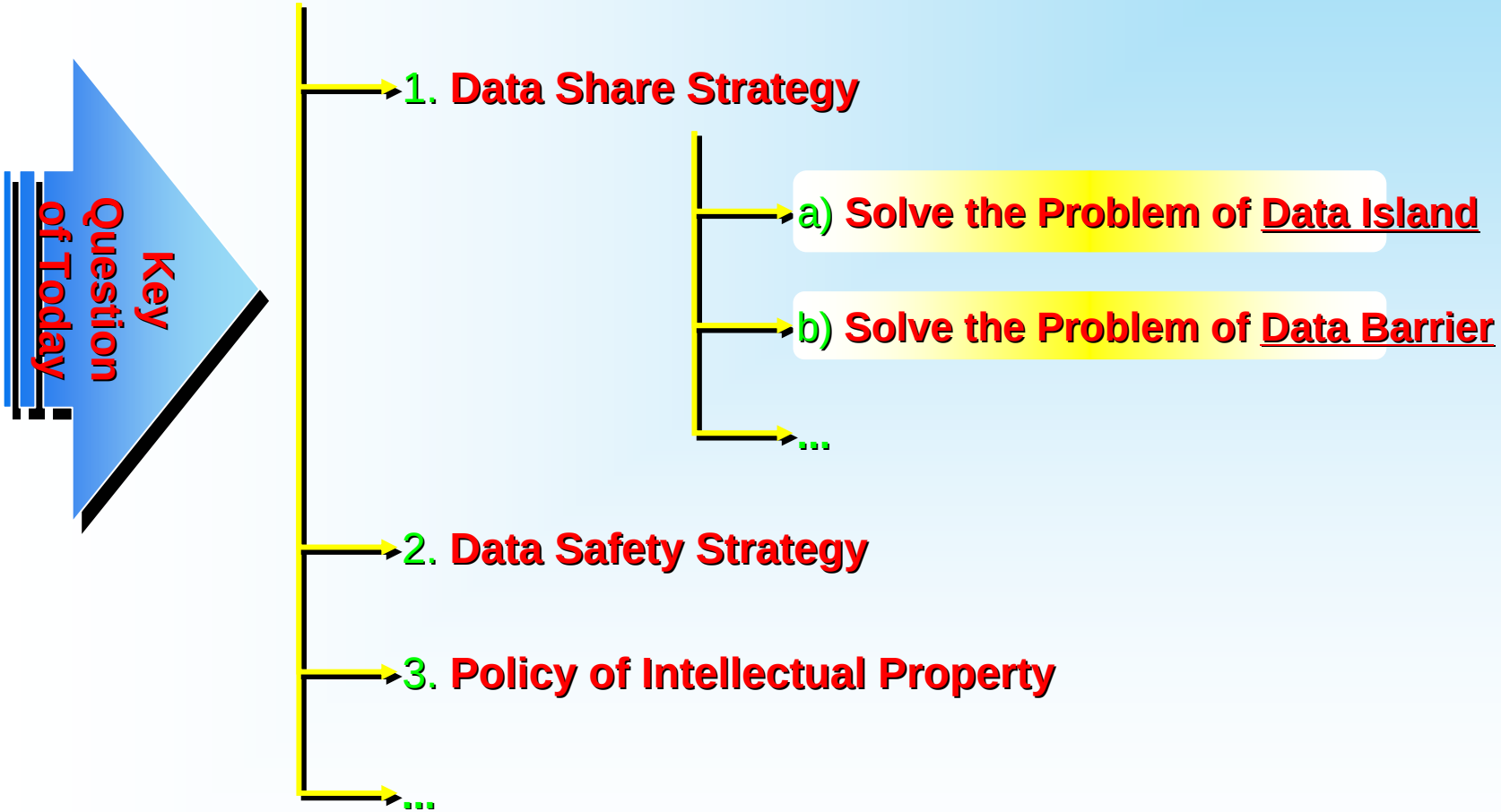
As the virtual earth system realized with multi-resolving and dynamic dimensions on datum of mess geographical coordinate system embedded:

1) The distributed global database system built and managed by different country and organization on the basis of the global high-speed network
2) Earth photographs by the high-resolution satellite
3) Virtual reality technology for high intelligent man-machine conversation
4) Interactive operational techniques
5) Metadata

- Strategy of Networked System Construction for Digital World History: Networked (3)

Scientific Data Strategy (B): Policy environment aspect

Scientific Data Strategy on the Environment Aspect of Policy

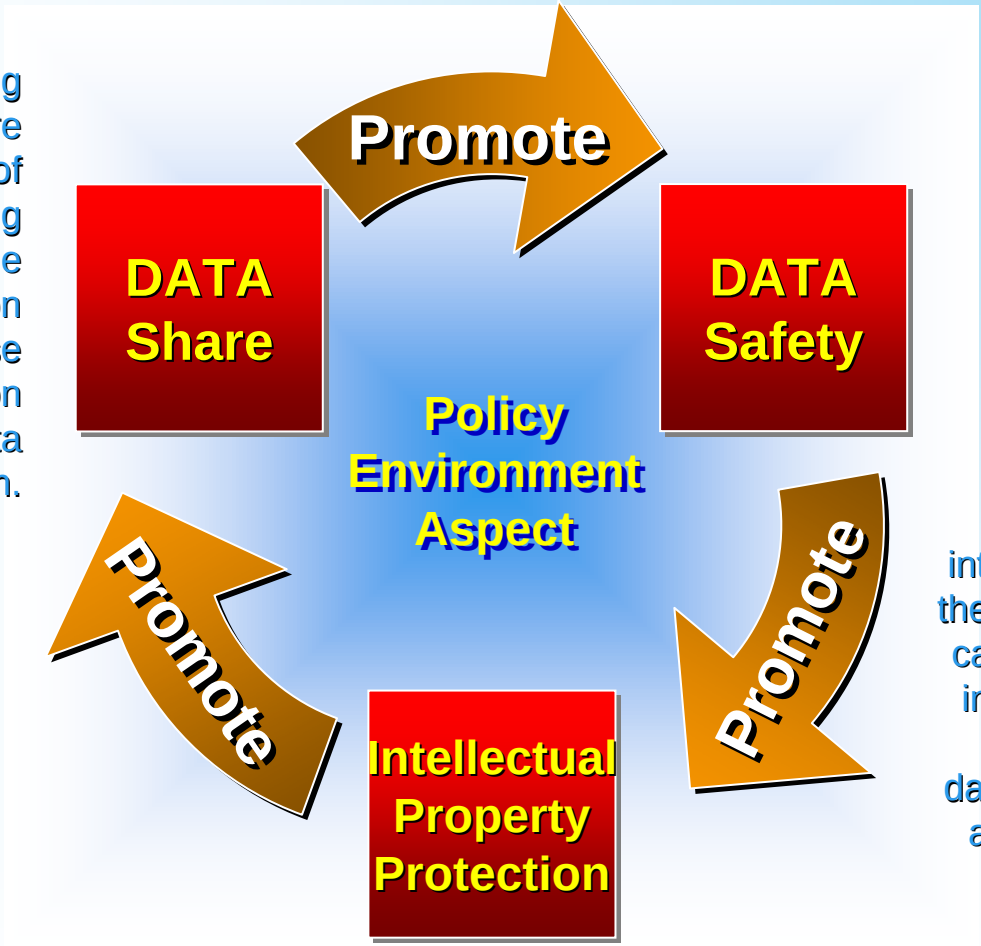


- Scientific Data Strategy: Technology aspect, policy aspect and integration of system frame

Scientific Data Strategy (B):

Data Share, Data Safety and Intellectual Property

➢ The data sharing and data safety are the two aspects of mutually restricting and owning the dialectical relation of these informatization things in the data application.



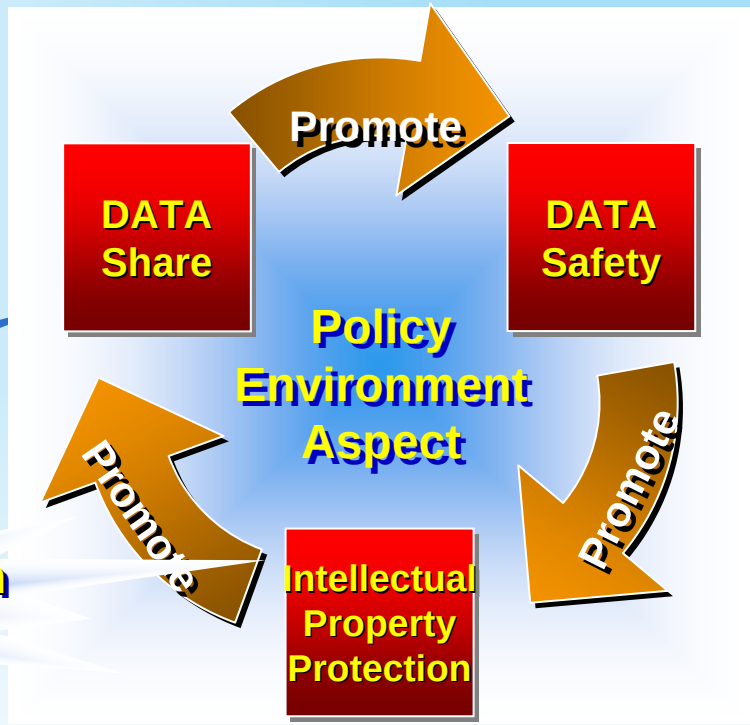
➢ The protection of intellectual property on the digital world history, can be at least divided into two issues, which are the protection of data source introduced and system and each developed model of digital world history.

- **Scientific Data Strategy (B): Policy environment aspect (1)**

Scientific Data Strategy (B):

Solve the problem of Data Island and Data Barrier

➢ As one notice, it is easier to solve the problem of Data Island in the way of data share with the development of science and update of applied informational technology. However, it is quite hard to clear up the obstacle, known as “Data Barrier”, preventing one from sharing data, which can not be solved with scientific policy.



- **Solve of Data Island**

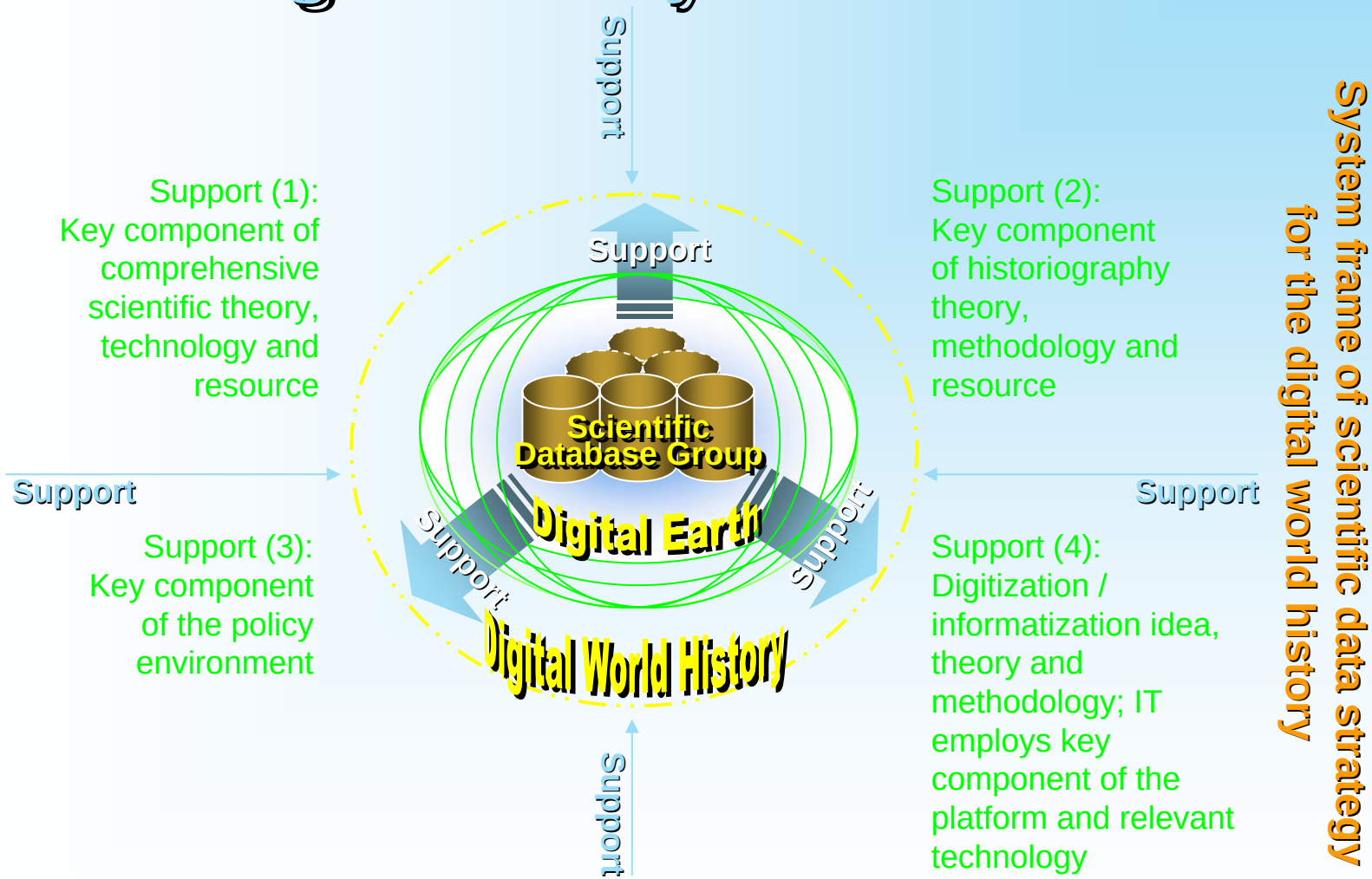
Comprehensive administration taking technology as the core.

- **Solve of Data Barrier**

Comprehensive administration taking policy as the core.

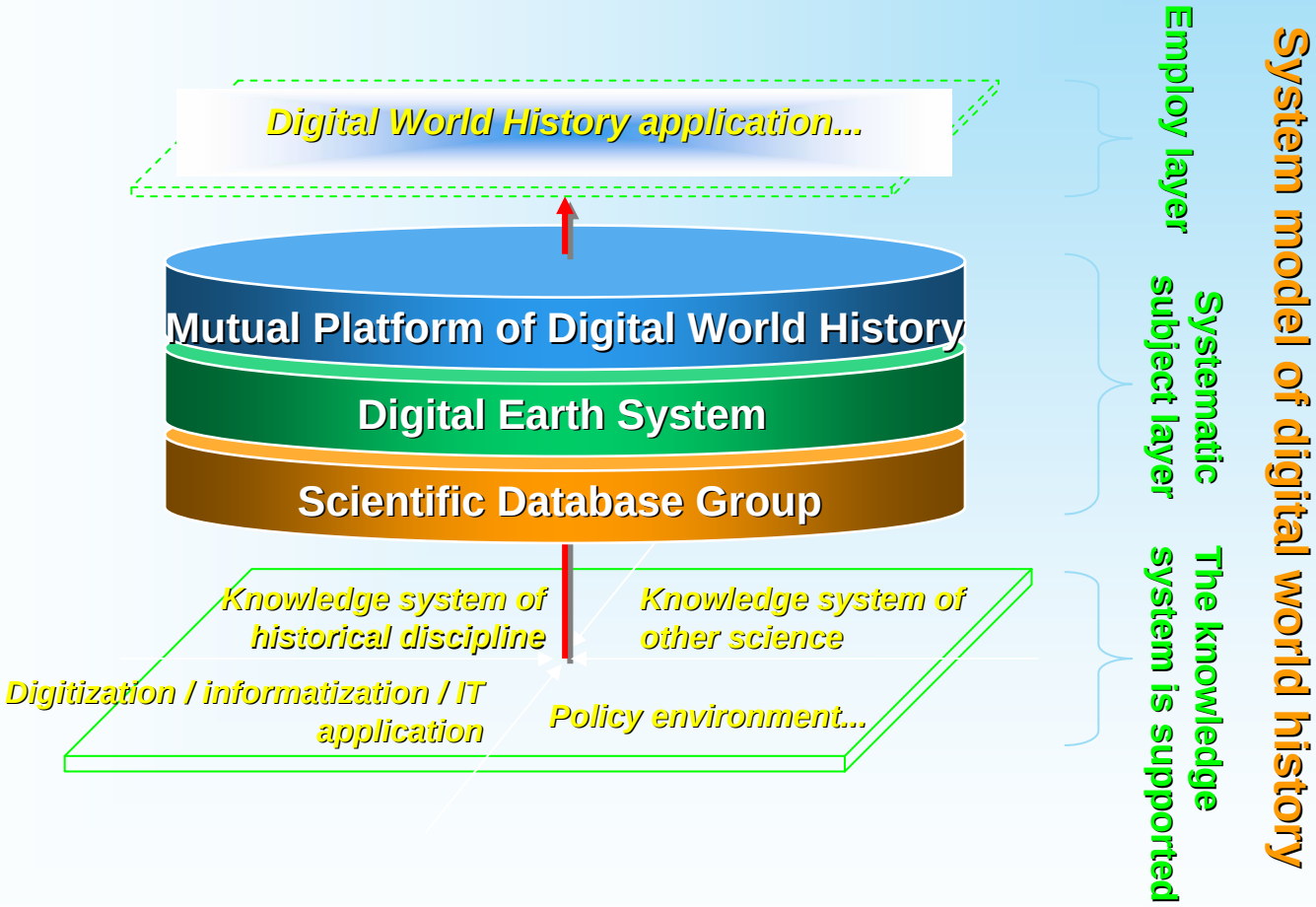
- **Scientific Data Strategy (B): Policy environment aspect (2)**

Scientific Data Strategy (C): Integration of system frame[1]

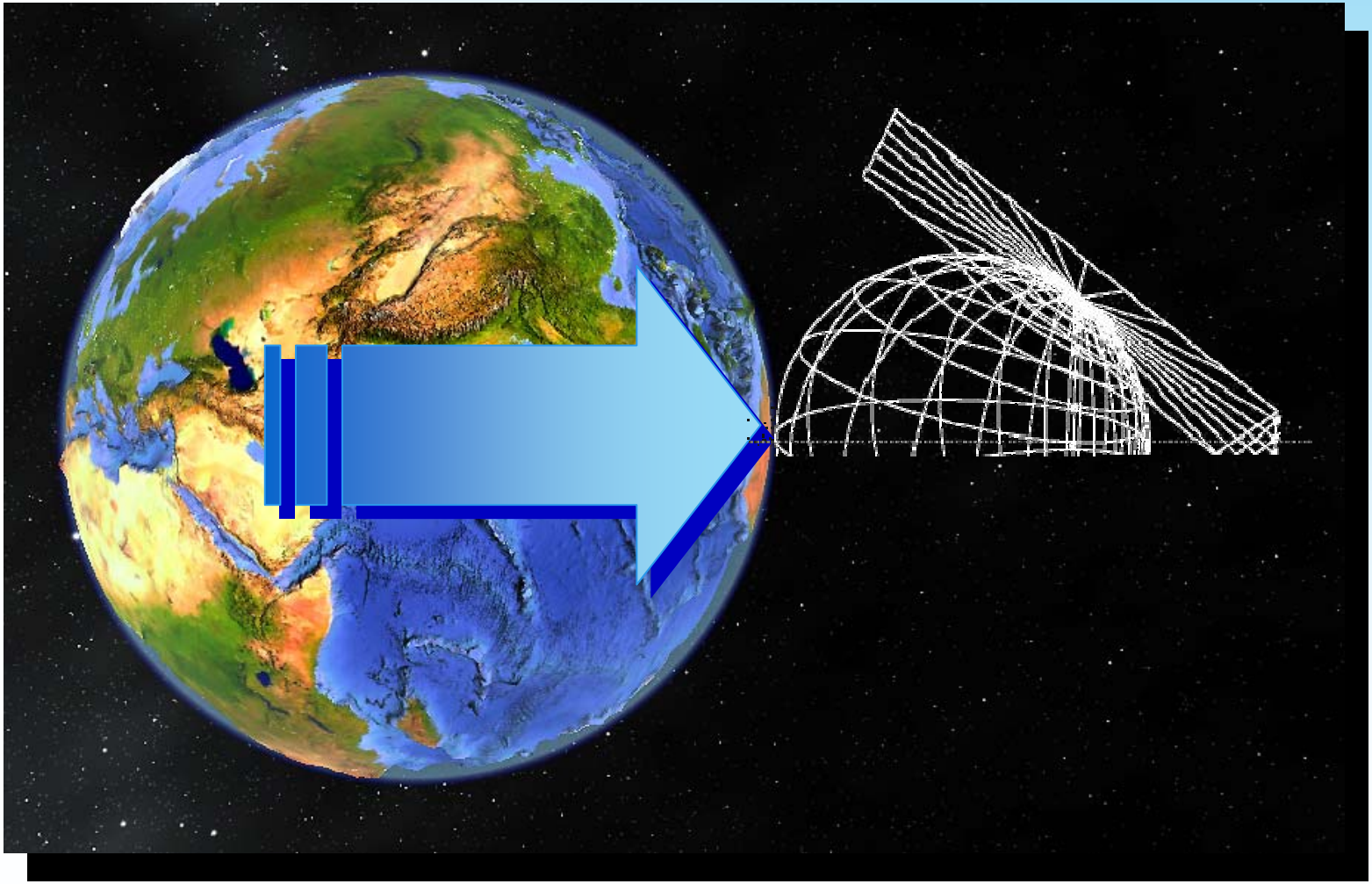


- Scientific Data Strategy: Technology aspect, policy aspect and integration of system frame

Scientific Data Strategy (C): Integration of system frame[2]



- Scientific Data Strategy: Technology aspect, policy aspect and integration of system frame



- Digital World History System sketch constructed by the paradigm and approach