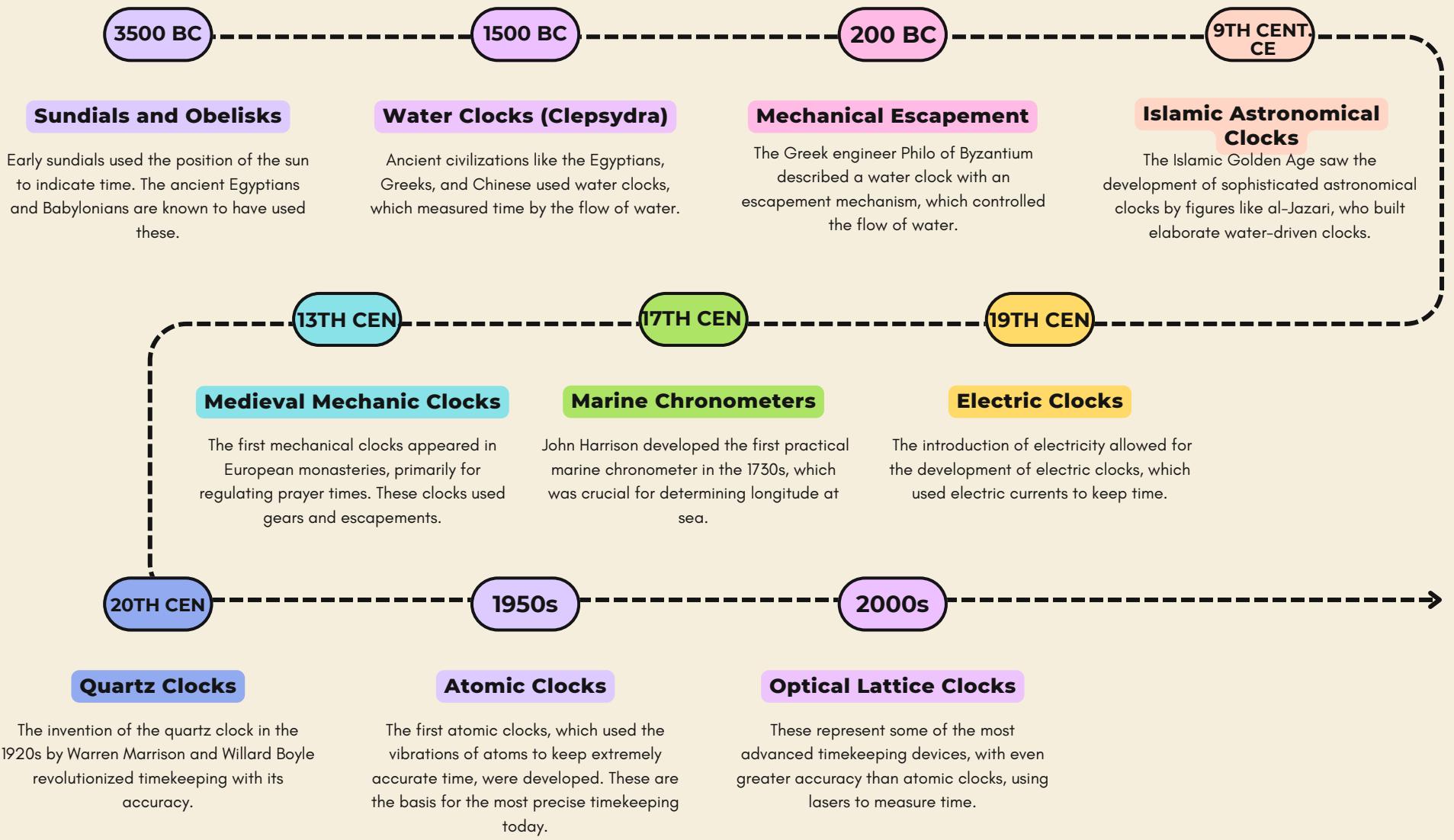


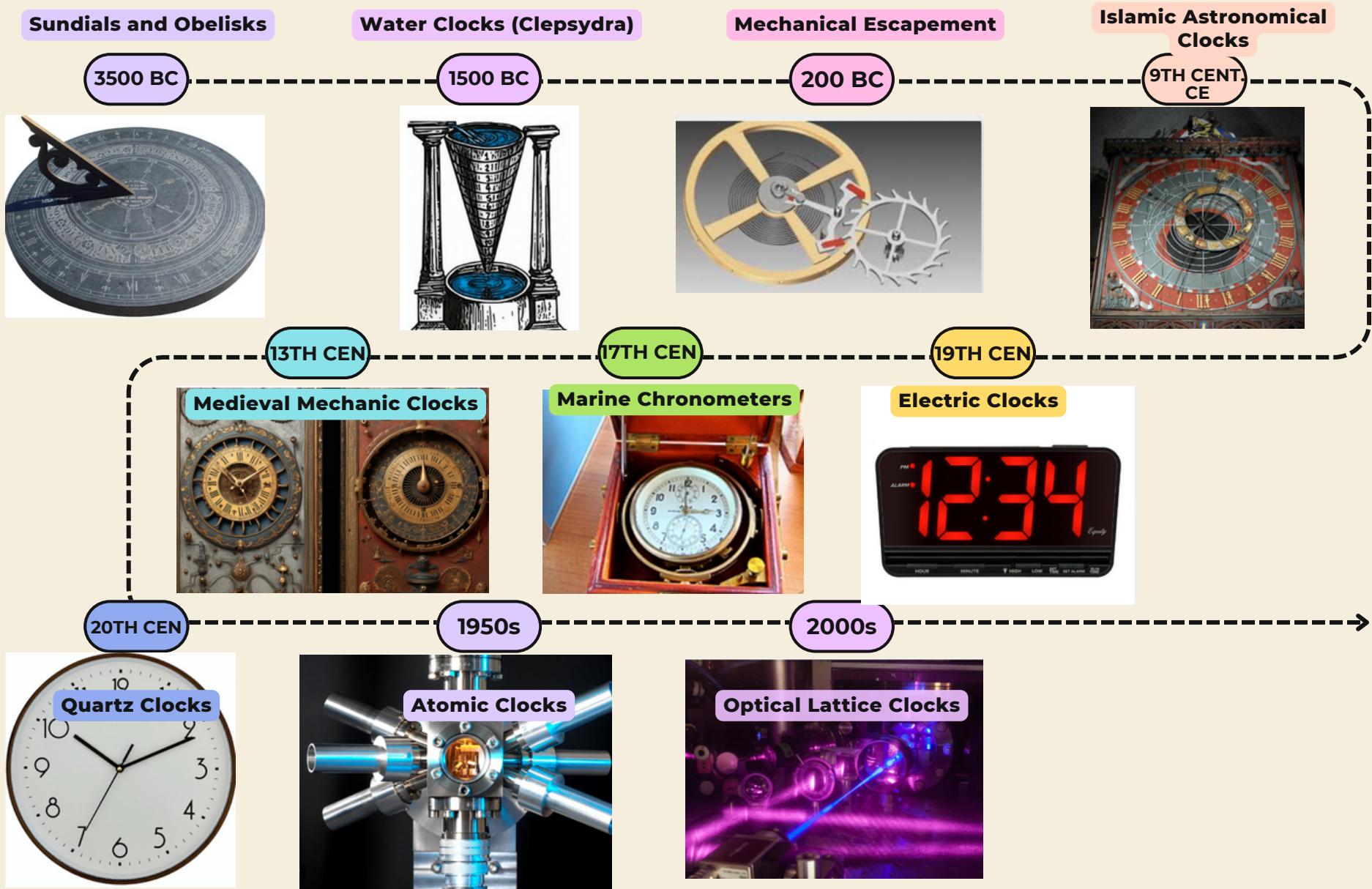
# **UNDERSTANDING THE HISTORY AND INTERFACES OF CLOCKS**

Interaction Design-1, A2 assignment  
Navya Kaushik and Saachi Junagade

# Timeline



# Timeline



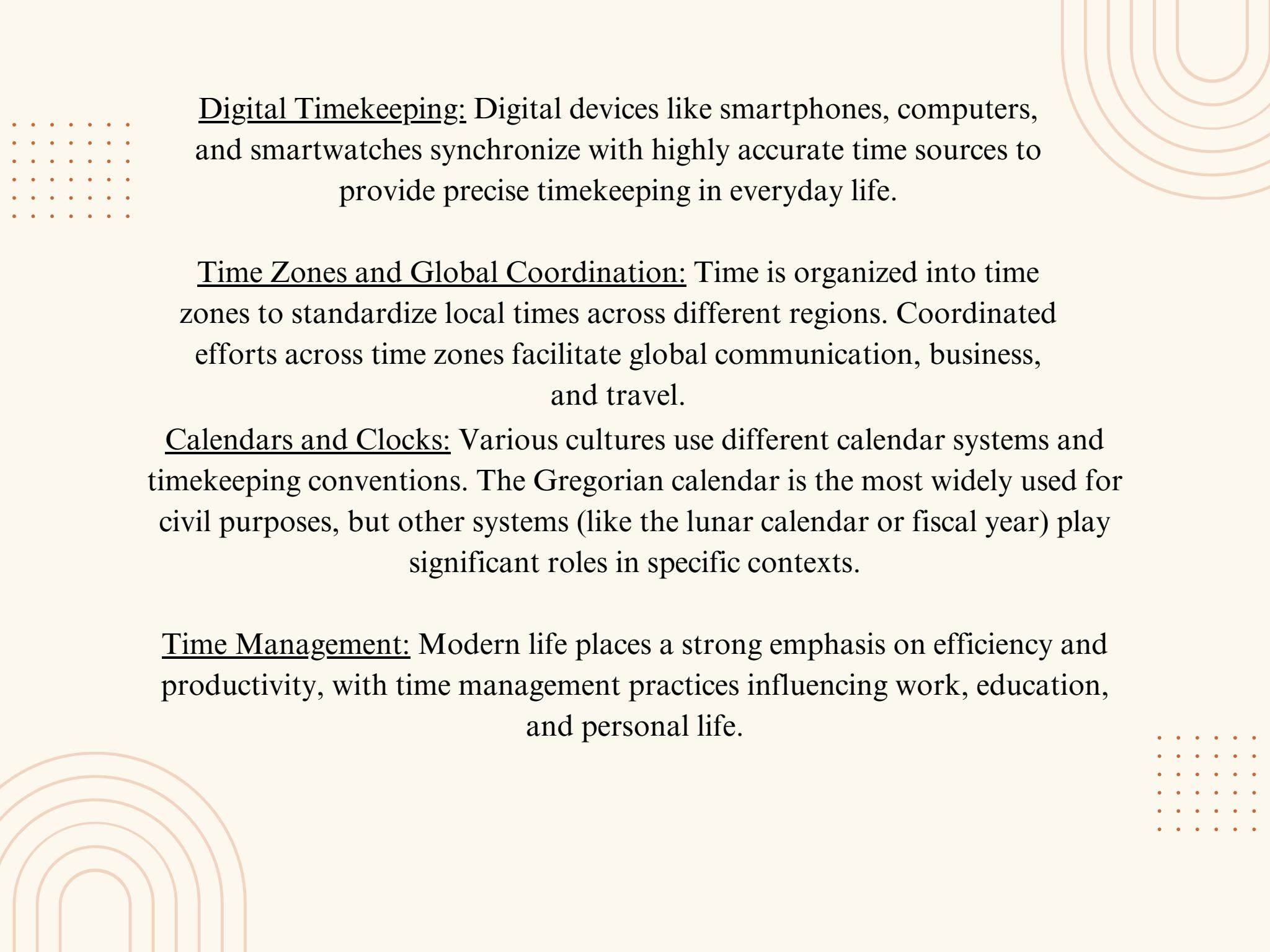
# Present Day Concept of Time

Today, our understanding of time combines accurate scientific measurements, philosophical ideas, technology, and cultural habits. It includes a universal system for keeping time consistent worldwide, as well as a personal experience that varies from person to person and is shaped by social influences.

Atomic Time: Time is measured with extraordinary precision using atomic clocks, which rely on the vibrations of atoms (like cesium or rubidium) to define the second. This form of timekeeping is fundamental for scientific research, GPS systems, and telecommunications.

International Atomic Time (TAI): A highly accurate time standard that combines measurements from atomic clocks around the world.

Coordinated Universal Time (UTC): The time standard used globally, which is based on atomic time but occasionally adjusted with leap seconds to account for Earth's rotation irregularities.



**Digital Timekeeping:** Digital devices like smartphones, computers, and smartwatches synchronize with highly accurate time sources to provide precise timekeeping in everyday life.

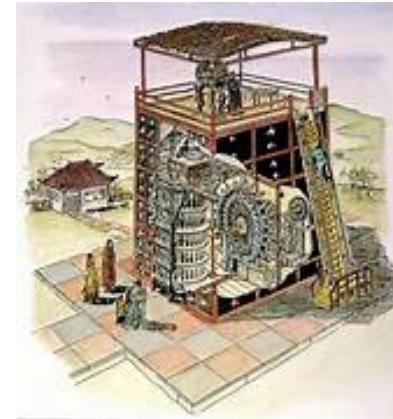
**Time Zones and Global Coordination:** Time is organized into time zones to standardize local times across different regions. Coordinated efforts across time zones facilitate global communication, business, and travel.

**Calendars and Clocks:** Various cultures use different calendar systems and timekeeping conventions. The Gregorian calendar is the most widely used for civil purposes, but other systems (like the lunar calendar or fiscal year) play significant roles in specific contexts.

**Time Management:** Modern life places a strong emphasis on efficiency and productivity, with time management practices influencing work, education, and personal life.

# Emergence of timezones

- Before the late 1800s, it was commonplace for individual towns to specify a local time that citizens would then try to replicate on their personal watches or clocks.
- Numerous clock towers were constructed throughout the world to display local time and provide sound
- Although these clock towers existed in some cities, the local time was not always obvious. Upon arriving to a new location, people would either have to locate a town clock or seek out someone who worked in the business of resetting personal clocks.
- Passengers disembarking the train were forced to set their clocks back one hour and then do the same in reverse upon returning to another place when travelling by train
  - However, with the advent and popularization of railroads as a method of traveling quickly across long distances, this soon had to change.
- Sir Sanford Fleming, a Canadian engineer, was the first person to propose the use of worldwide time zones back in 1878.
- His idea was to divide the world into 24 time zones that were each 15 degrees of longitude apart. The reason for this is that the earth rotates 15 degrees every hour, or 360 degrees in 24 hours.



## **different types of clocks**



# Analog clocks

## Affordance:

- clock affords the ability to tell time.
- The presence of hour, minute, and second hands
- The large, clear numbers and distinct hands afford easy readability from a distance, making it suitable for public spaces, classrooms, or offices.

## Signifier:

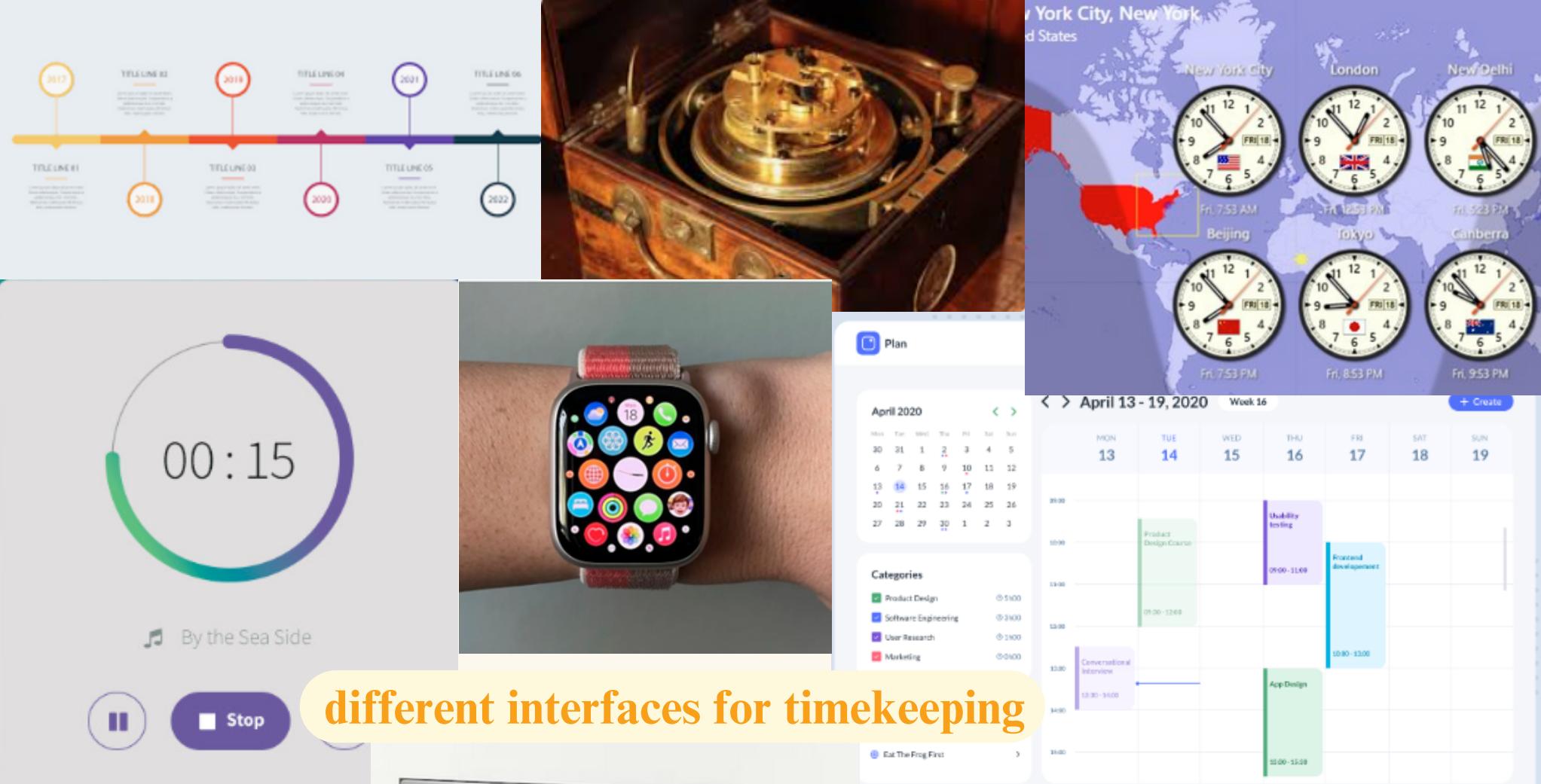
- Hour and Minute Hands
- Second Hand
- Numbered Dial
- Circular Shape



Mapping: mapping between the hands and the time they represent is direct and intuitive. digital clocks are even more easily readable though

## Feedback:

- synchronization of the hour, minute, and second hands as they move also serves as feedback.
- Auditory feedback



## different interfaces for timekeeping

# Biological clock

- Circadian rhythm is the 24-hour internal clock in our brain that regulates cycles of alertness and sleepiness by responding to light changes in our environment.
- Our physiology and behavior are shaped by the Earth's rotation around its axis



# Different fields that require timekeeping

education

agriculture

entertainment

religious  
practices

military

transportation

gaming

psychology

sports

**astronomy**

**navigation & maritime exploration**

**astrology**

**physics**

**finance & mechanics**

**medicine**

**legal systems**

**Meteorology & Climatology**

**History & Archaeology**

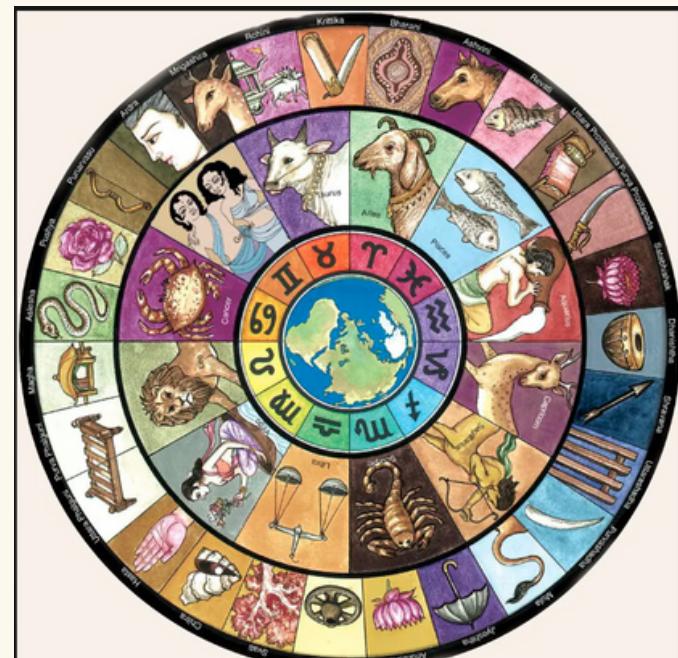
**Communication Technology**

**Engineering**

# Astrology

As astrologers brought in the influence of the Sun, Moon, planets, and stars into their predictions, astronomy became their science. Gradually time-keeping, so essential to astronomical calculations, evolved into an experimental and esoteric technique.

[https://www.academia.edu/47520078/Measures\\_of\\_time\\_in\\_ancient\\_India](https://www.academia.edu/47520078/Measures_of_time_in_ancient_India)



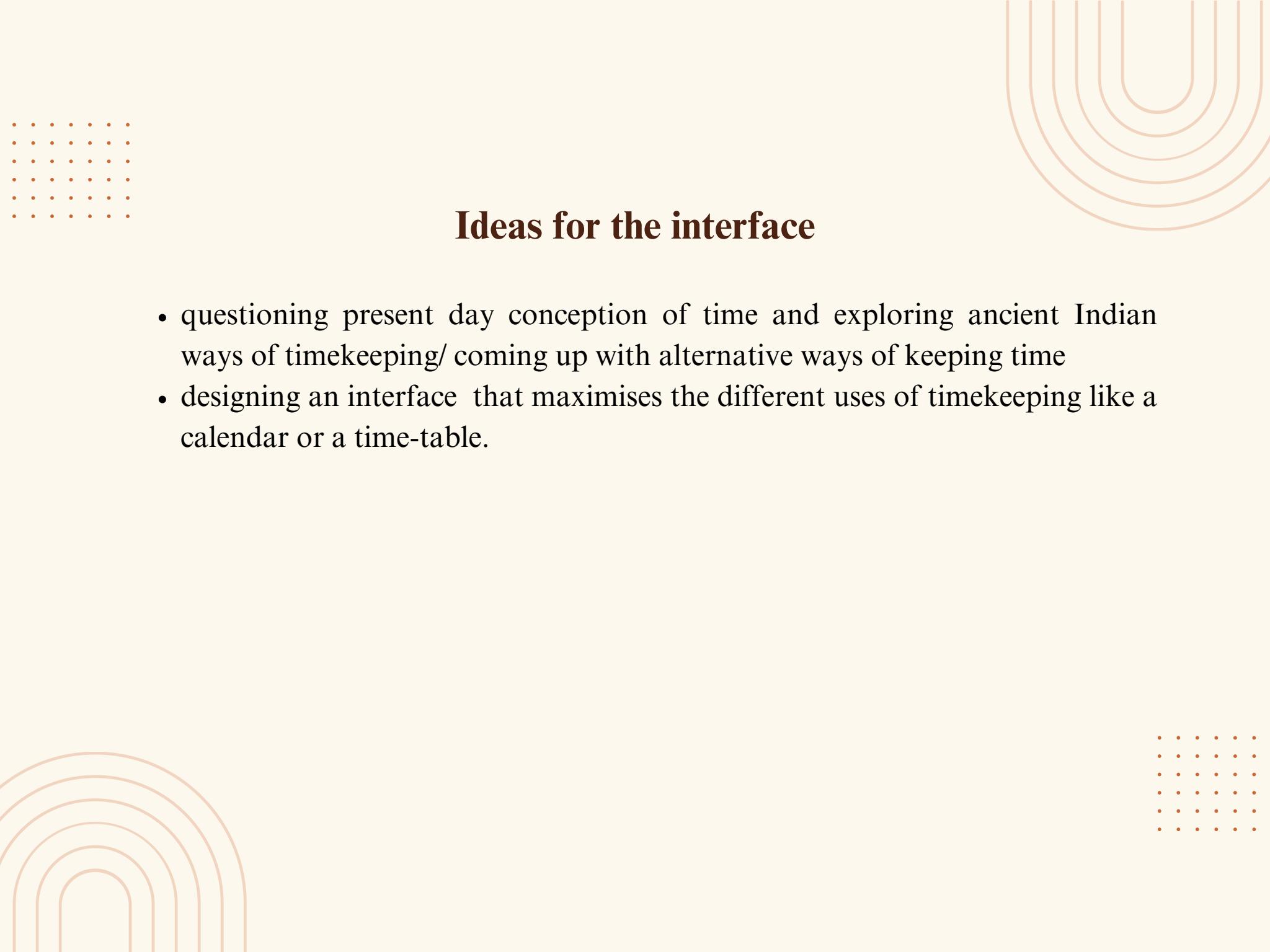
## Ancient India's relationship with time

- The oldest Indian manuscript on astronomy that is relevant to time-keeping appears to be the Vedanga Jyothisa.
- formalized between 1200 and 600 B.C and written in Sanskrit verse
- It starts with a cycle of five solar years (yuga), beginning at the white half of the month of Magha (January-February) and ending with the dark half of Pausa (December-January). Each year has two progressions (ayanas) of 183 civil days (savana divasa), each civil day (or nycthemeron) measured from sunrise to sunrise. The length of each day from sunrise to sunset increases by one prastha during the northward progression (uttarayana) of the Sun while the night shortens by the same amount. This variation is reversed during the southward progression (dakshinayana).
- Hindu imagination theorized about incredibly small subdivisions of time, down to the truti which was 33 microseconds. In the other direction too, though they were destitute of a chronology and though they could not date any event beyond a single generation, the Hindu astronomers formulated a chronological framework reaching forward and into the past for millions of years.

## Devices for timekeeping in ancient India

- A copper vessel with a hole in the bottom set in a basin of pure water sinks sixty times in a day and night and is an accurate hemispherical instrument.
- Indian sundials and water clocks





## Ideas for the interface

- questioning present day conception of time and exploring ancient Indian ways of timekeeping/ coming up with alternative ways of keeping time
- designing an interface that maximises the different uses of timekeeping like a calendar or a time-table.