Carving up the world at its political joints

Overview
The world is made up of nearly 8 billion people living in 196 countries, seated across a 360 degree globe. The people living in those countries all follow a standard of time that has evolved significantly in the last two centuries. Before the invention of the clock, it was common for people to keep ‘solar time’ (ex: with a sundial), which in effect created thousands of time zones around the world. As globalization and international business became greater influences of and drivers for change, so did timekeeping. The result: standardized time zones.

However, this organizational system that enables us to experience the same relative standard of time is rife with bias, antiquated notions of global hierarchy, and is highly politically influenced. As this case study will cover, questionable design principles have led to a poorly designed system that is currently challenged.

What is being organized?
Time zones organize geography into regions that follow the same standard of time (a standard in this context is “making distinctions, either implicitly or explicitly, between “standard” and “nonstandard” ways of creating, organizing, and using resources.”

The time standard that a region is supposed to follow is designated by its longitudinal distance (or offset) from the Coordinated Universal Time (UTC), expressed in terms of UTC+ or UTC-. The original design principles that created time zones in the late 19th century stated that each 15 degree slice on the world map would be equivalent to an hour difference, starting with the Greenwich Meridian (Prime Meridian).

Given those directives, there should be a total of 24 time zones, or 25 if you include the International Date Line (see figure 1). But, we are not simply organizing geography, we are also organizing interactions between people. As such, we ultimately have 39 different - contested - time zones, some of which are 30 minutes or 45 minutes apart (see figure 2).

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1 Glushko, Robert J. The Discipline of Organizing. 3rd ed., p. 401
As discussed in TDO, “Some of the interactions with resources in an Organizing System are inherently determined by the characteristics of the resource.”\(^2\) As it pertains to this example, certain instances of interactions between people that are being organized by time zones have gone awry. This is a direct result of the characteristics of the people making them: their tendency toward bias that favors themselves. Though the goals of the organizing system and its design principles are worthwhile, the introduction of bias into those design principles (basing everything off of the Greenwich Meridian) set a tone and an unfortunate new standard for bias that continues today.

**Why is it being organized?**

There are several historical reasons for time zones to exist. The first is basic timekeeping. As mentioned earlier, most societies keep time based on the rising and setting of the sun. Because dawn and dusk occur at different times in different places, time zones became a way to standardize time that’s still generally based on that principle.

The second is globalization. With the advent of globalization, it became increasingly important to create a standard in timekeeping for communication, economic and transportation purposes (specifically “to unify local times for railway timetables”)

The final reason is locational accuracy. Meridians were used for longitudinal reference in different countries and became a way to accurately pinpoint the location of ship at sea, for example.

Though a standard was put into place for agreed upon reasons, a lack of compliance continues to complicate this system. For example, Daylight Savings Time was expanded to 8 months of the year in 2007. But because some regions did not follow suit, this change resulted in an increase of afternoon fuel consumption, more international trade logistics and an annual cost of nearly $150 million to airlines.

**How much is being organized?**
As mentioned earlier, the entire world has been carved into time zones, with the current number still being heavily contested. Some say there are 24, while others argue 25 or even 39. This perspective depends heavily on the definition of a time zone.

**When is it being organized?**
The standardization of time via time zones began in 1764 when John Harrison found that a clock could be used to accurately locate a ship's position at sea. This led to the creation of the Act 5 George III (a longitude Act) in 1765. As noted above, it continues to evolve to this day.

**How (or by Whom) is it being organized?**
This is the most fascinating of the design questions after ‘what is being organized’. The internationally agreed-upon standard for organizing time into time zones was adopted at the 1884 International Meridian Conference at Washington DC, led by President Arthur and Sir Sandford Fleming, and attended by 41 delegates of 26 nations. At the time, England was considered the “centre of the transit instrument” (presumably the center of commerce and transportation), and therefore it was decided that the Greenwich Meridian would serve as the basis for timekeeping for the rest of the world (known today as UTC). It should be noted that not all delegates voted to fix the meridian at Greenwich, which is why Paris did not adopt GMT until 1911.

Though England is no longer the center of commerce and transport, the original political bias involved with making this decision continues to stand strong. A great example of this is the International Space Station. Due to the number of times ISS orbits the sun (15.7 times per day, see figure 4), the ISS needed to lock into a chronologically consistent time. The time zone of choice was UTC (otherwise known as GMT) to have a time that accommodates both Houston (US

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command) and Moscow (Russian command). The frame of time within which we interface with other planets is now based on a decision made 131 years ago.

![ISS orbit around Earth, which does not follow the Prime Meridian](image)

**Figure 3:** ISS orbit around Earth, which does not follow the Prime Meridian

The more difficult aspect of this equation, however, is not that we continue to use an outdated standard for how we keep time. It’s the fact that we are not universally in agreement over this standard. Rather, some countries perceive UTC, Daylight Savings Time and the International Date Line to be guidelines. The reasons for these disagreements are always politically driven - an attempt to introduce new bias into the decision making process. Some use time as a political statement of unity, as with the examples of China and Samoa (figures 4 and 5).

China, a country that spans 5 time zones, decided to ignore international time zone standards in 1949 and instead create a single time zone. Though all the reasons for creating time zones in the first place are still an issue for China (such as business owners having to adjust their hours which can be confusing to travelers), the decision to appear as a united front was of utmost importance to Mao, as Communism had just taken control of a recently fragmented society.

Following suit, Samoa had an equally political and symbolic reason for changing time zones. In this case, Samoa found it important to align itself with its two biggest trading partners (Australia and New Zealand) instead of the United States. Until the end of 2011, Samoa fell east of the International Date Line, observing the same time as its neighbor American Samoa, which continues to observe UTC-11:00 (Samoa Time Zone) year-round. When the change was made at the end of December 29th, 2011, Samoa had to switch to UTC+13:00 given its border with the International Date Line and continued directly to December 31st, 2011. This act physically changed the International Date Line.

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6 http://astronautabby.com/the-international-space-station-time/
Finally, others disrupt the time zone standard at a regional level as a result of bottom-up intentional arrangement, meaning ‘the system requires explicit or implicit acts of organization by agents in a collective intelligence fashion’\(^9\) (see figure 6). Australia is divided into 3 time zones, and has both vertical and horizontal time zones due to some regions not following Daylight Savings Time. Some of them are half-hour and quarter-hour time zones, depending on the time of year. By law, the entire country began following DST in World War 1 and continued to do so until the 1970s. But, rather than continuing to enforce DST, that decision became individual to each Australian state, and some regions have opted to not participate due to overwhelming public support against it.

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\(^9\) Glushko, TDO 08.26.2015 Lecture Slides 1.3 - Definitions for Organizing Systems
**ADDENDUM**

The images and maps interspersed throughout my case study in combination are my artifact, and were chosen to represent points made about how political bias drive the creation and adjustment of time zones.

It is also worth pointing out that the way these maps have been crafted make them examples of the same bias time zones are affected by. For example, figure 1 is a map of the world, one that does not show time zones specifically, but is used to express that time zones were meant to follow longitudinal lines. Even so, the map is centered around the Prime Meridian, visually representing Western Europe as the center of the world.

Moreover, maps may not have overtly visible biases, but there may be inherent ones, such as default or ‘de facto’ time zones that act as representatives for an entire region or country. Whereas China’s map is the inverse of this phenomenon (as it only has the default time zone), others like the Continental US are less forward about theirs (the default time zone being EST)\(^\text{10}\).

\(^{10}\) [https://en.wikipedia.org/wiki/Time_in_the_United_States](https://en.wikipedia.org/wiki/Time_in_the_United_States)