which synchronises the timing parameter $t \in \vec{\mathbb{R}}_{s+}$ with $n \in \vec{\mathbb{N}}$ in the counting process.
If we always start the chronology from $s=0$, we get a simplified expression.
$\vec{\mathbb{R}}_+ \coloneqq \{t \in \vec{\mathbb{R}} \mid \lfloor f_c \cdot t \rfloor \in \vec{\mathbb{N}} \;\wedge\; f_c, t \in \mathbb{R}_+\}$ and the surjective map $\vec{\mathbb{R}}_+$ on $\vec{\mathbb{N}}$,

(1.12) $$TIMING\colon\; t \to t_n \coloneqq \lfloor f_c \cdot t \rfloor,$$

which synchronises the timing parameter $t \in \vec{\mathbb{R}}_+$ with $t_n \in \vec{\mathbb{N}}$
The order relation in $\vec{\mathbb{R}}_+$ and $\vec{\mathbb{N}}$ ensure that timing parameter always goes *FORWARD*.

$$\overrightarrow{0\;\;1\;\;2\;\;3\;\;4\;\;5\;\;6\;\;7\;\;8\;\;9\ldots}$$

A negative difference in timing parameter $\Delta t = t_2 - t_1 < 0$ simply means,
that the timepoint t_2 preceding the timepoint t_1 in the timing process

(1.13) $$t_2 \xrightarrow{FORWARD} t_1 \quad \Leftrightarrow \quad \Delta t = t_2 - t_1 < 0$$

The timing parameter t is growing *FORWARD*.
Since the real numbers are not numerable, the actual time $t \in \mathbb{R}$, or strictly speaking the continuous timing parameter $t \in \vec{\mathbb{R}}_{s+}$ cannot be assigned a causal property, but only the ***primary quality*** *FORWARD* as in $\vec{\mathbb{R}}_+$.
We look at any small time-interval $[t_1, t_2] \in \vec{\mathbb{R}}$, that always can be divided an infinite number of times, so $t_1 < t_\infty < t_2 \;\wedge\; t_\infty \in \vec{\mathbb{R}} \;\wedge\; t_\infty \notin \mathbb{Q}$.
Because of the ban of infinity regress, there is no causal interconnection from t_1 over t_∞ to t_2 although there can be a causality for a physical ***entity*** at an event at t_1 to the event at t_2.
The continuity of the concept of Time is a *secondary quality* that we humans experience or have invented.
If we shall understand the ***causal action***, it shall be able to ***quantise*** the events along a developed timing parameter. I.e., that the points t_n along the timeline for the development parameter should be numerable just as the rational numbers $\mathbb{Q}$. This can be achieved by constructing a bijection $\vec{\mathbb{Q}} \leftrightarrow \vec{\mathbb{N}}$ and we must always find a comminute time measure by an injective map $\mathbb{Q} \longrightarrow \mathbb{R}$, where the events are numerable and thus quantised in a ***causal action***.
This means that we are obliged to construct a clock whose frequency f_c is so high that we can distinguish the individual events, and count them, or at least take them into account.[19]
The individual events in a clockwise time measure must be quite similar but distinguishable, so they can be counted. – It is not good enough, e.g. counting one particle, one atom, one molecule, one apple, one pear, one moon, one planet, one star, one galaxy, etc... Instead, we count the next tick of the clock or else in common the next oscillation of the Caesium atomic clock. We always count the same type of information from the individual oscillation swing-spin from the clock.
The continuous time measure from an information development parameter $t \in \mathbb{R}$ (created from the numerable timing) means that we can analyse by differential and integral calculus and, as we shall see, Fourier integral analysis with 'time' as a continuous parameter.
Although the continuous real numbers have an ordering relation and we can assign a developing timing parameter $t \in \vec{\mathbb{R}}$ with a property, the ***primary quality*** *FORWARD*, it can never be the timing parameter $t \in \vec{\mathbb{R}}$, that's *causing* the events.

[19] As we will show later below, the photon γ is its own clock and can be autonomous used as its own measure.

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1.4. The Cyclic Time

The timeline with the numbers $t \in \mathbb{R}$ above represents linear *time* starting at the first beginning $\mathrm{A}(-\infty)$ and ending at the final end $\Omega(+\infty)$.[20] A different view of time is cyclical movement in a circle that originated in ancient Greece philosophy.

- A year goes by, given by the Earth circling the Sun.
- A month has gone, by the Lunar circled around the Earth.
- The diurnal passage, given that the Earth rotate around its axis relative to the sun.[21]
- Star clock, given as the circumpolar celestial stellar rotation around an eternal center.[22]
- The daytime, given as one rotation of the clock's hour hand, (12 figure steps)
- One Hour, given as one rotation of the clock's minute hand, (60 figure steps)
- A Minute walk, which is one rotating clockwise second hand, (60 figure steps)
- Time of a Second, one tock of a clock, or
  one rotation of a small motor in a quartz clock $f_c = 1Hz$.
- AC electric motor (sync), 50 turns per second $f_c = 50$ Hz. (in the USA, etc. 60 Hz)
- Caesium atomic clock oscillate with the frequency $f_c = 9{,}192{,}631{,}770$ Hz.

Here you can count the cyclic process times. We see that cyclic movement is a good basic unit for measuring time. We can count the turns of a wheel that rotates in a circular motion. – Each turn in the circle is one oscillation.
The same event reappears for each rotation and can be counted.
In this way, we see that any oscillation can be a cyclical circular motion,
a rotation in which the same event recurs periodically.
Cyclic rotation can be described as a circular motion in a plane. Circular movement in the plane $\odot$ is different from the linear timing process since the former returns to the same event at periodic intervals.

1.4.1.1. The Period

Traditionally we call a number for the time of one cycle or one rotation in the circle $\odot$ the oscillation period T, and from this, we form an oscillation frequency $f = 1/T$, hence $T = 1/f$.
When we count the oscillations m, we get a development parameter $t_m = m \cdot T = m/f$
How do we determine these numbers t_m for the repetitive circular motion $\odot^m$ when we as a starting idea only have the number of oscillations $m \in \mathbb{N} \subseteq \mathbb{Z}$, when we from the traditional definition have $m = f \cdot t_m$? We need to compare relative to another cyclic oscillation, – a reference circular motion $\odot_c$, which then is promoted as a reference clock $\odot_c^n$, wherein the number of oscillations $n \in \vec{\mathbb{N}}$ is counted consecutively.
Which can provide a timing indication $t_n = n \cdot T_c = n/f_c = n \in \vec{\mathbb{N}}$, because, by definition $T_c \coloneqq 1/f_c \equiv 1$, for such a reference clock, i.e. $f_c = 1$ and $t_n = n \in \vec{\mathbb{N}}$.
The oscillations m, in the cyclical circular motion $\odot^m$ at intuit frequency f are counted along with the clock oscillations $\odot_c^n$, counted from the coincidence $(\odot^m \approx \odot_c^n)$ to the next coincidence, so

(1.14) $$n = n/f_c = t_n \approx t_m = m/f \quad \Rightarrow \quad f = m/n \in \mathbb{Q} \quad \text{and} \quad t_m = m \cdot T \in \mathbb{Q}$$

As a principle, the relatively measured cyclic frequency f is always a rational number.
When we count the minute, hour, day, and year length in seconds, we always get the time figures as an integer number of seconds (by definition). Similarly, a second is also an integer number count of Cs_{133} oscillation.
In this way, an actual time measurement will always be a count of a cyclical oscillation

[20] The Christian church fathers' answer to the ancient cyclical conception of time is time starts at the creation goes over the days of Christ and ends at the end of the world. An alternative view from Big Bang over our Universe to Big Crunch.
[21] Previously it was assumed that the sun circled the earth.
[22] Seen from Earth. It is believed that the ancient Egyptians had faith, that the eternal was in the middle of the circumpolar sky.