```
\int_{t_0}^t
                                                                                                         H(t')dt'

\begin{array}{l}
\overrightarrow{U}_{0},t) = \\
\underline{\mathcal{I}}e^{-\int_{t_{0}}^{t}H(t')dt'}
\end{array}

    \lim_{N\to\infty\Delta t\to 0} \exp\left[-\frac{1}{2}\right]
    H(t_{N-1})\Delta t \exp \left[-\frac{1}{2}\right]
    H(t_{N-2})\Delta t \cdots \exp\left[-\right]
    \lim_{N\to\infty} \Delta t\to 0 \prod_{j=0}^{N-1} \exp\left[-\frac{1}{2}\right]
  H(t_j)\Delta t \Big] \\ j = \\ j\Delta t \\ N\Delta t = \\ t - \\ \underline{t}_{\underline{0}} \\ \underline{\underline{t}}_{\underline{0}}

\frac{\underline{t_0}}{\overline{H}_0}

0, t) = \exp[-H_0(t - t_0)]

\frac{\partial}{\partial t}

\frac{\partial}
         H(t)
    E_n(t)|n(t)\rangle
E_n\{|n(t)\rangle\}
    \begin{array}{l} t\\ \psi(t)\rangle =\\ \sum_{n} a_n(t)e^{\theta_n(t)}|n(t)\rangle\\ \theta_n(t) =\\ \end{array}
      (-1/\hbar) \int^t dt' E_n(t')
      \begin{vmatrix} n(t) \\ \psi(t) \end{vmatrix}
    \hbar \sum_{n=0}^{\infty} [(\dot{a}_n(t) + (\dot{a}_n(t)))_e
    a_n(t)\partial_t\theta_n(t))e^{\theta_n(t)}+
      \underline{a_n(t)}e^{\theta_n(t)}\partial_t]|n(t)\rangle
    \overline{h} \sum_{n} \dot{a}_{n}(t) e^{\theta_{n}(t)} |n(t)\rangle
         \sum_{t=1}^{n} E_n(t) a_n(t) e^{\theta_n(t)} |n(t)\rangle
  \begin{array}{l} + \\ \hbar \sum_{n} a_{n}(t) e^{\theta_{n}(t)} \partial_{t} | n(t) \rangle \\ \sum_{n} E_{n}(t) a_{n}(t) e^{\theta_{n}(t)} | n(t) \rangle \\ \sum_{n} \dot{a}_{n}(t) e^{\theta_{n}(t)} | n(t) \rangle + \\ a_{n}(t) e^{\theta_{n}(t)} \partial_{t} | n(t) \rangle = \\ \end{array}
    \langle m(t)|
 \langle m(t) | \sum_{n} \dot{a}_n(t) e^{\theta_n(t)} | n(t) \rangle + a_n(t) e^{\theta_n(t)} \partial_t | n(t) \rangle = 0 
    -\sum_{n} a_{n}(t)e^{[\theta_{n}(t)-\theta_{m}(t)]}\langle m(t)|\partial_{t}n(t)\rangle
     \begin{array}{l} \stackrel{\dots}{\partial_t} \langle m(t) | H(t) | n(t) \rangle = \\ \langle \partial_t m(t) | H(t) | n(t) \rangle \end{array} 
         \stackrel{+}{\langle} m(t) | \partial_t H(t) | n(t) \rangle
```