Tumblegotchi balance

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The most important question when making any game is: what will be the impact on the user?

In this case, the Tamagotchi たまごっち(egg watch) impacted children by teaching them the difficulties and joys of caring for something helpless. The name is poignant considering how American grade school children were given chicken eggs to watch around that age to teach the same lesson.

According to our design pillars taking care of an egg is very suitable. However for the design of our Tumblegotchi and my job regarding it I am focusing less on egg and more on watch.

Any useful watch of course tells the time, but the egg watch is more of a *timer*. A game that is essentially a timer serves the purpose of reminding the user after a period of time has passed, or in other words, calls the user to attention after a period of time has passed.

This is at a surface level unattractive for the majority of productive people. A person working who is constantly distracted by a crying pet would no doubt be harassed by their supervisor to ditch the pet and focus on their job.

And that is in many ways true, but there is some more complexity to the science of attention that we can look into, and actually take advantage of to completely change the dynamic of the Tumblegotchi in a workplace.

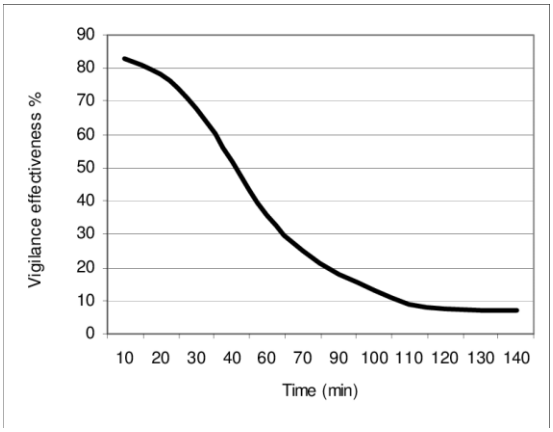
Mark, Gudith, Klocke 2008 is big in pop psychology for their misquotation that “it takes 23 minutes to get back on track after a distraction” I won’t go into too much detail but that really isn’t what the findings of their study dictate. Essentially they found “When people are constantly interrupted, they develop a mode of working faster (and writing less) to compensate for the time they know they will lose by being interrupted”

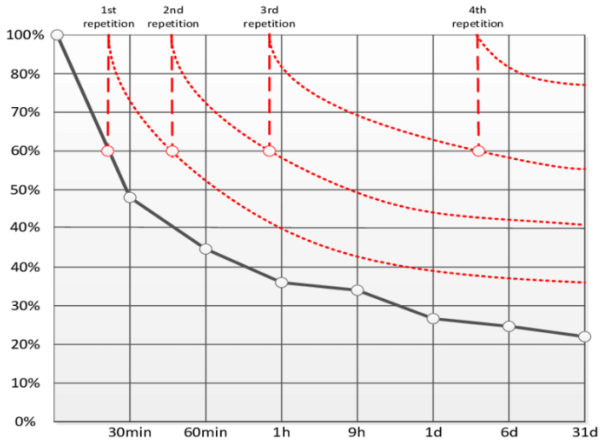
Even so, constant interruption via the Tumblegotchi doesn’t align with goal. We don’t want people being forced to rush on their work because they have to feed him every moment.

We know through a plethora of research, from many fields, that sustained attention definitely decreases over time. (Fortenbaugh, DeGutis, Esterman 2017) (Warm 2008) We also know, however, that taking breaks can reset the cognitive decline from extended labor. (Ariga & Lleras, 2011) (Buch et al 2021)(Sonnentag, Venz, & Casper 2017)

How can we utilize this and facilitate quality focus with the Tumblegotchi?

> Disruptiveness of interruptions is for an important part determined by three factors: interruption duration, interrupting-task complexity, and moment of interruption (Borst, Jelmer & Taatgen 2015)
>
> Several studies have shown that the longer the interruption is, the longer it takes to resume the interrupted task [4,23,35], and the more errors are made after the interruption [4]. In addition, more complex interruptions (e.g., solving 17+36 as compared to 2+3; [23]) also lead to longer resumption times [13,14,20,23,35]. Both effects were nicely demonstrated by Monk et al. [35].
>
> Depending on whether subjects were interrupted mid-subtask or between subtasks, interruptions were more or less disruptive.
>
> (Borst, Jelmer & Taatgen 2015)





Depicted here on the left is showing vigilance decreasing over time for aviation (Hobbs 2008), on the right is an “Alteration of the forgetting curve through repetition according to Ebbinghaus (1885) and estimations from Paul (2007)” (Schimanke, Florian & Mertens, Robert & Vornberger, Oliver 2013)

Neither of these are perfect comparisons but I think we can thread the needle and derive some axioms with which we can base our Tumblegotchi timer on.

Interruption Duration: we want to keep this low

Interruption task complexity: we want to keep this simple

Moment of interruption: How can we control this?

It looks like we have a timer window from 10 minutes to around 60 minutes to test with.

We can't directly interrupt people perfectly when their subtask is complete, but we can understand the impact of choosing a shorter timer or a longer one.

Examples are the Pomodoro Method, DeskTime method, and what I'll call DeskTime v2.

Pomodoro **is 25 minutes work, 5-10 minutes rest**

DeskTime is **57 minutes work, 17 minutes rest**

DeskTime v2 is **112 minutes work, 26 minutes rest.**

So we can choose to copy any one of these tried and tested productivity methods to base our balance.

We want to prioritize a small interruption time, due to the fact that our game doesn't have high gameplay complexity. On the other hand, We don't want to interrupt the user too much and catch them between subtasks. Additionally, we have to balance the multiple means of interaction with the game (picking berries, playing with jelly, feeding jelly, etc.)

So I suggest making use of all three findings, and it seems fitting since we have 3 activities of various involvement.

We can have the jelly want to be played with every 25 minutes, which only involves a moment of interaction.

We can have the jelly need to be fed every 57 minutes, which takes a little more time, but more importantly gives Jelly dew, which leads the player to spend some time browsing the shop.

We can have the berry bush regenerate every 112 minutes, because after picking the berries we are going to be incentivized to purchase things and interact with the game further.

For some reason I really like a daily or twice a day cycle for the berry bush regeneration.

Bibliography

Gloria Mark, Daniela Gudith, and Ulrich Klocke. 2008. The cost of interrupted work: more speed and stress. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '08). Association for Computing Machinery, New York, NY, USA, 107–110. https://doi.org/10.1145/1357054.1357072

Fortenbaugh FC, DeGutis J, Esterman M. Recent theoretical, neural, and clinical advances in sustained attention research. Ann N Y Acad Sci. 2017 May;1396(1):70-91. doi: 10.1111/nyas.13318. Epub 2017 Mar 5. PMID: 28260249; PMCID: PMC5522184.

Warm, S.J. & Matthews, Gerald & Finomore, Victor. (2008). Vigilance, workload, and stress. Performance Under Stress. 115-141.

Sonnentag, S., Venz, L., & Casper, A. (2017). Advances in recovery research: What have we learned? What should be done next? Journal of Occupational Health Psychology, 22(3), 365–380. https://doi.org/10.1037/ocp0000079

Ariga, A., & Lleras, A. (2011). Brief and rare mental "breaks" keep you focused: Deactivation and reactivation of task goals preempt vigilance decrements. Cognition, 118(3), 439–443. https://doi.org/10.1016/j.cognition.2010.12.007

Buch et al., Consolidation of human skill linked to waking hippocampo-neocortical replay, Cell Reports, June 8, 2021, DOI: 10.1016/j.celrep.2021.109193

Borst, Jelmer & Taatgen, Niels & Rijn, Hedderik. (2015). What Makes Interruptions Disruptive?. 2971-2980. 10.1145/2702123.2702156.

Hobbs, Alan. (2008). An Overview of Human Factors in Aviation Maintenance.

Ebbinghaus H. Memory: a contribution to experimental psychology. Ann Neurosci. 2013 Oct;20(4):155-6. doi: 10.5214/ans.0972.7531.200408. PMID: 25206041; PMCID: PMC4117135.

Schimanke, Florian & Mertens, Robert & Vornberger, Oliver. (2013). WHAT TO LEARN NEXT? CONTENT SELECTION SUPPORT IN MOBILE GAME-BASED LEARNING.