

SYSTEM DYNAMIC MODEL OF WORKER EFFICIENCE

In a fast-moving constantly evolving society, individuals might easily become worn out and unable to operate effectively if they are not careful. Disproportionate stress could lead not only to chronic fatigue but also to a wide variety of psychological, medical, and behavioral problems such as irritation, alcoholism, mental illness, and heart diseases.

The main idea of this work is to outline the dynamics of worker burnout and explore the negative influence of stress on worker's energy level. For the subject of our research let's review the article of Jack B. Homer "Worker burnout: a dynamic model with implications for prevention and control", adding to it a few new variables, considering the personal experience, which are extremely important to explore the topic.

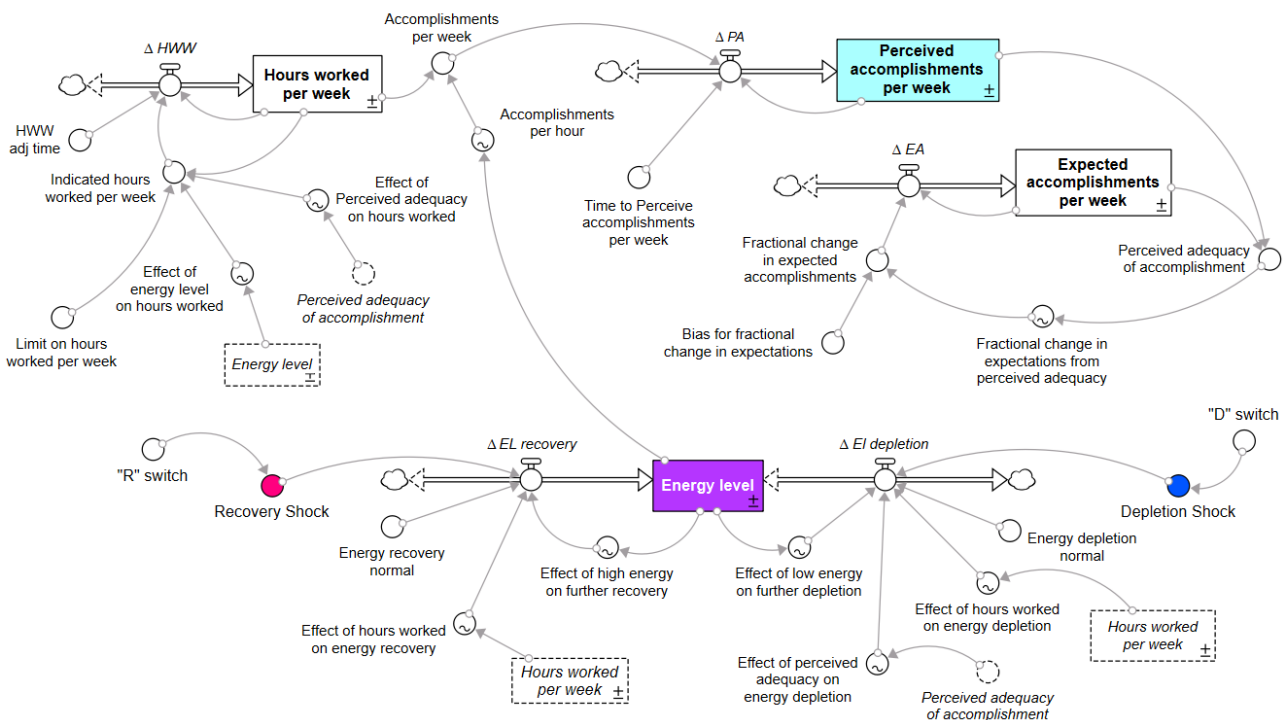


Figure 1. Worker burnout model

The basic behavior of the model is presented over a 75-week time horizon (Fig. 2 and Fig. 3). During this time, the weekly accomplishment rate rises, but then falls dramatically three times along with the energy level. Burnout cycle has a period of 30 weeks, and one-third of it is the decline phase during which accomplishment decreases to one-sixth of its maximum value.

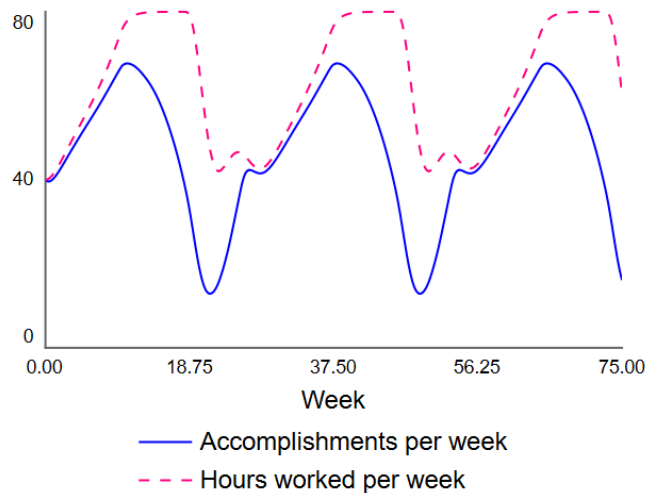


Figure 2. Accomplishment and hours worked per week (without shocks)

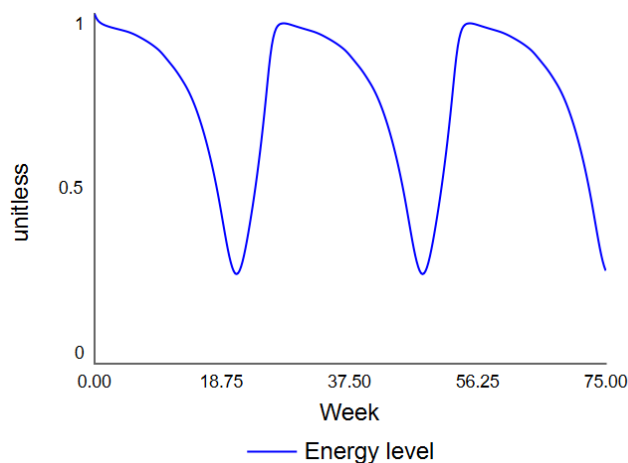


Figure 3. Energy level (without shocks)

Now let's focus on the biggest part of the model, containing Energy Level and try to add some shock. As far as it concerned there are a great deal of variables that could influence energy recovery. But if we delve into the issue of energy level, we can easily understand that beside proven influential components of energy level we could facilitate energy recovery as well. Obviously, our emotional and physical health is improving after minding our own business. And clearly it depends to a large extent

on individual's scope of activities, interests and abilities (volunteering, sports, travelling, art, music, dancing, child care, etc). According to this assumption let's add some "positive shock" (after fifth working week) to our model that contribute to energy recovery.

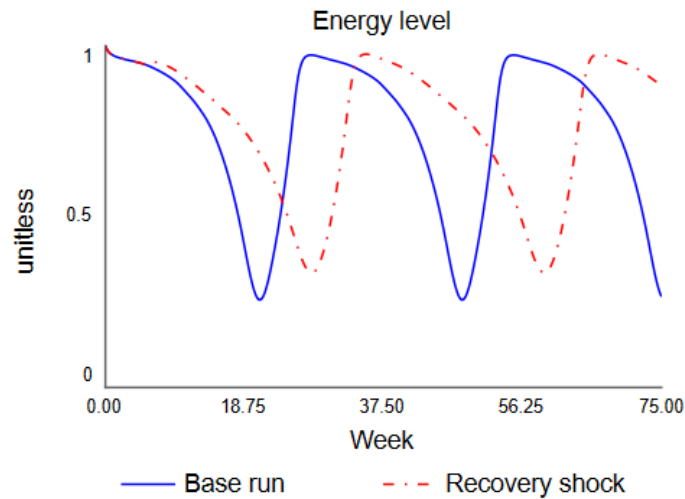


Figure 4. Comparison of Energy level (base run and run with recovery shock)

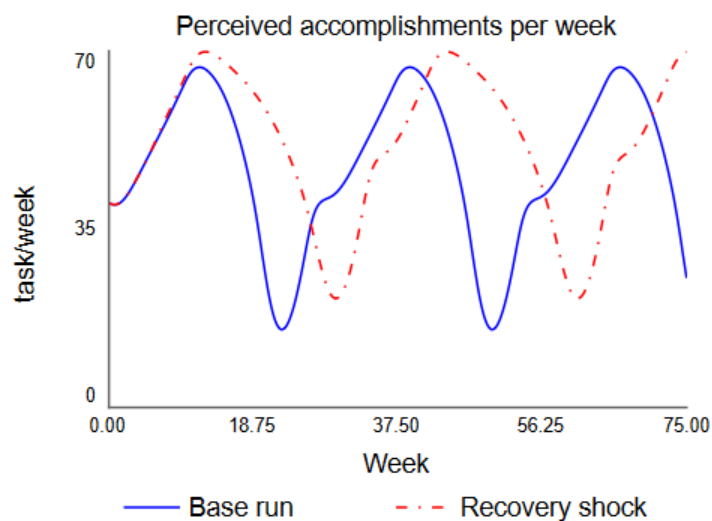


Figure 5. Comparison of Perceived accomplishment (base run and run with recovery shock)

Fig. 4 represents the behavior of energy level after adding the recovery shock. And from what we can see, the decision of adding into daily grind some hobbies or favorite activities is always improving human's well-being. The energy level does not fall so low, comparing with the previous occasion (the lowest point is now 8% higher). Furthermore, energy recovers even a bit more efficiently (the highest point is now 0.5% higher).

Concerning the difference between runs of perceived accomplishment, it's important to emphasize that "shock" induce the individual to increases in the completed tasks over the same period of time (Fig. 5). Moreover, person manages to accomplish six more tasks per week (being out of resource) in contrast to the initial conditions.

A similar approach could be used regarding some negative aspects that could sharply depreciate our energy level: crash dieting, insomnia, trouble at home, people who are used to act like "powers vampire", depression, etc. According to this assumption let's try to add some "negative shock" (after fifth working week) to our model that contribute to energy depletion.

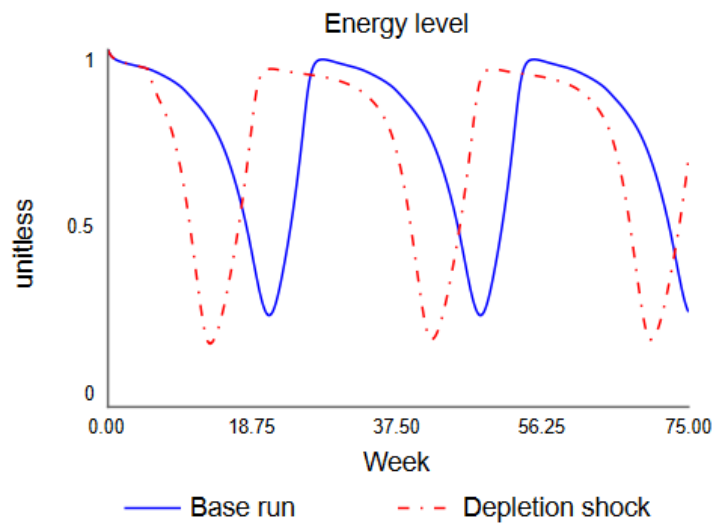


Figure 6. Comparison of Energy level (base run and run with depletion shock)

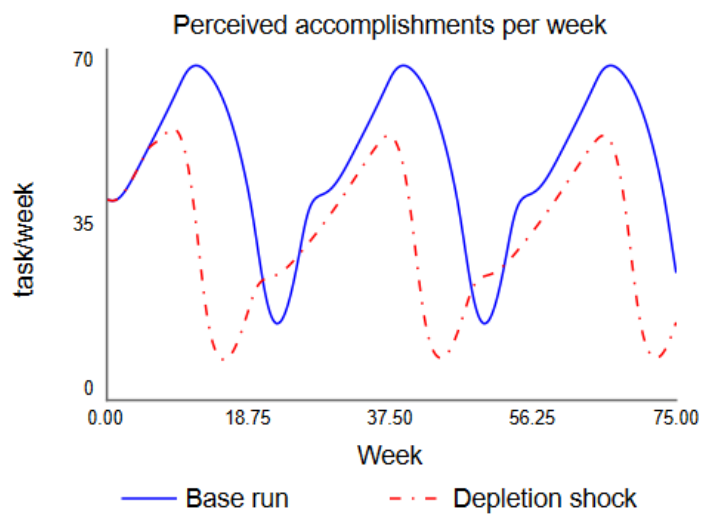


Figure 7. Comparison of Perceived accomplishment (base run and run with depletion shock)

Fig. 6 represents the behavior of energy level after adding the depletion shock. And from what we can see, all of the aforementioned causes are worsen human's well-being. The energy level is falling even lower, comparing with the base run (the minimum point is now 8% lower). Furthermore, energy recovers less efficiently (the highest point is now 2.6% lower).

Concerning the difference between runs of perceived accomplishment, it's important to emphasize that "shock" induce the individual to decreases in the completed tasks over the same period of time (Fig. 7). Moreover, person manages to accomplish seven less tasks per week (being out of resource) and fourteen less tasks per week (even having maximum energy supply) in contrast to the initial conditions.

Therefore, to summarize all simulations, we come to the conclusion that after minding our own business, doing some hobbies and favorite activities it becomes far easier to perform the work and all daily stuff. In comparison, all the negative aspects sharply depreciate our energy level and reduce the amount of accomplished job.

References

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