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SYSTEM DYNAMIC MODELING OF WORKER EFFECTIVENESS

The success of any type of business depends on the work accomplished by the employees. High demand of employer and desire of the employee to accomplish tasks can lead to burnout of the later.

"Two-thirds of full-time employees say they have experienced burnout at some point in their careers" [1]. Homer in his article writes: "the idea context for burnout combines a workaholic personality type with a disagreeable, and therefore highly stressful, job" [1, p.43]. In Margaretha's study [3] was concluded that intrinsic motivation reduces employees' burnout. Intrinsic motivation is a tendency "to seek out novelty and challenges, to extend and exercise one's capacity, to explore, and to learn" [4 as cited in 2].

The purpose of this work is to build a simplified system dynamics model, based on Homer's worker burnout model described in [1], to help understand how the process of burnout develops over time with addition to it of motivation and external demand from employer, and to make suggestions about how to solve the problem.

After being hired for the certain position the employer desired, he feels motivated in the expectation of solving the problems. At the beginning of his employment, he receives the tasks which he is eager to solve. He is full of energy and does his work very well. As he meets the demands of the employer he does not relax, on the contrary he sets himself some additional goals to develop himself. The employer sees that his subordinate accomplishes tasks and wants to push him to do even more. High expectations make the worker spend more hours at work. This depletes his energy level and after some time the worker ends up being extremely worn out. So, his motivation falls, and thus his further ability to work. As far as the worker hasn't managed to cope with the current demand, the employer has no choice except to decrease the demand. But the employee is already exhausted to the degree that even this doesn't save the situation.

Figure 1 illustrates how energy level, motivation, demand of tasks to accomplish and perceived results develop over time. Such reference mode was created based on the Homer's article [1] with addition of personal experience.

From the stated above materials, Homer's model [1] in combination with personal hypotheses the casual loop diagram was created presented in Figure 2.

Initial high level of worker's motivation and energy positively influence work productivity. The results increase, making the worker more and more satisfied with his accomplishments. But at the same time, it slightly tires him. Meanwhile the employer starts to increase his demand. This raises worker's expectations of his results and creases dissatisfaction with already accomplished work. So, longer hours

of work are required to fulfil the new goal. But this depletes energy, making the employee lose motivation and ability to work productively.

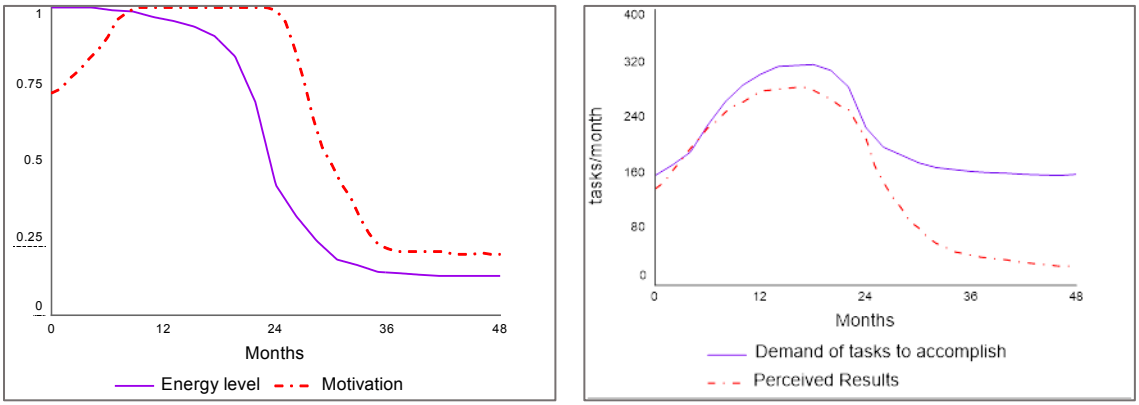

Figure 1. Reference more of behavior for main variables

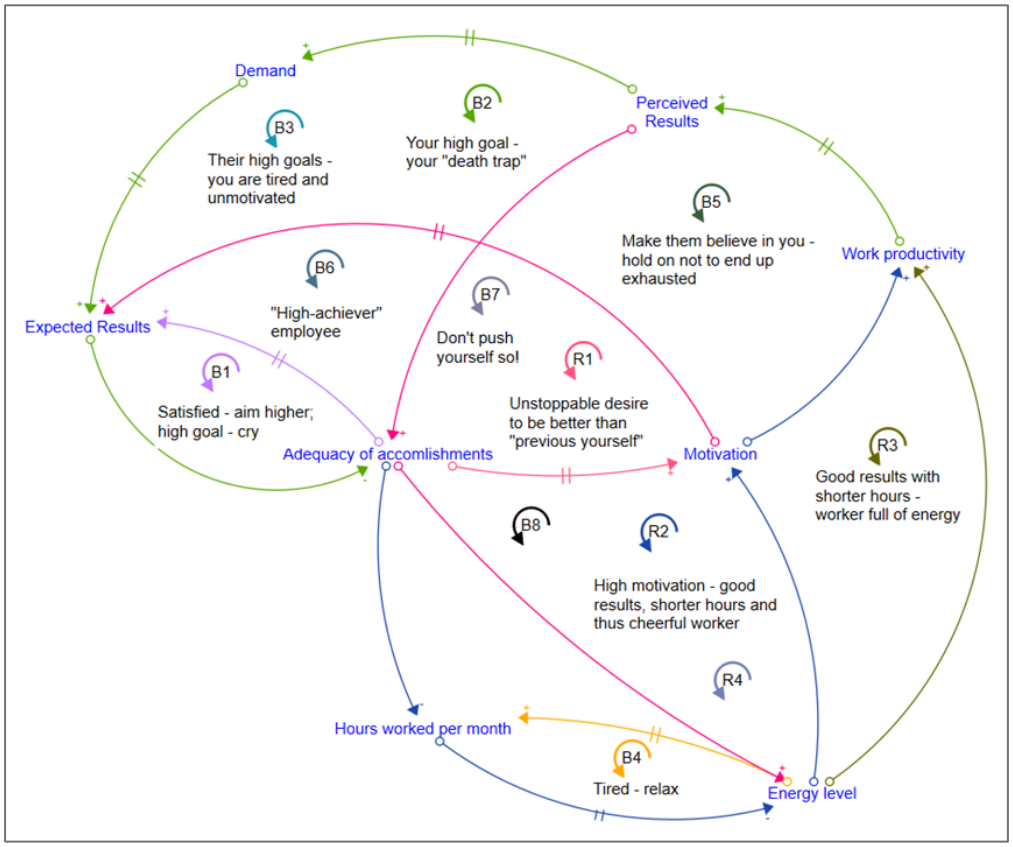

Figure 2. Casual Loop Diagram

Main assumptions: time horizon is 4 years; high achiever worker is considered, who try to accomplish all the tasks, and push themselves further; worker cannot influence employer's decisions; at the end of every month the employer receives report about accomplished results based no which decides to increase or decrease his demand.

In Figure 3. can be observed behavior of Motivation, Perceived Results, Energy Level, Demand of tasks to accomplish in baseline scenario.

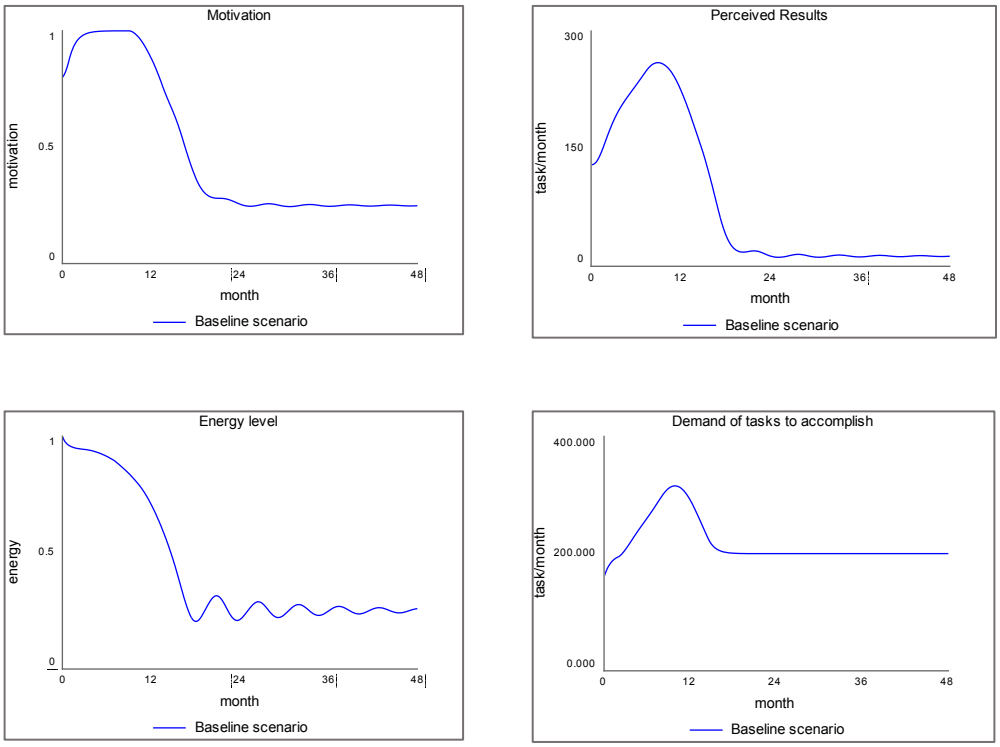

Figure 3. Baseline scenario for main variables

Initial values for motivation and work productivity are 0.8. With the shock in motivation during the first month, through loop B6 expected results increase, so adequacy of accomplishments decreases very slightly. Through loops R1 and R2 work productivity, perceived results, and adequacy of accomplishments rise. Also, loop B1 lets expected results rise as satisfaction with work is high. Through loops B2 and B3 employer's desire to expend employee's goals raises expected results, so the satisfaction from accomplished work starts decreasing slowly. Through loops B3, B5, R2, R3 employee begins working more hours, and this little by little depletes energy. So, while having maximum level of motivation, the slowly decreasing energy level, makes work productivity decline slightly. That was the behavior during first 10 months.

During months from 10 to 48 the behavior is following. High demand makes perceived adequacy of accomplishments decrease. This work as a signal for the employee to work long hours, and this through loops B4 and B8 causes decline in energy level, which leads to drop in motivation (loops R2, B3). So, workers can't be as productive as before, and work productivity with perceived results fall. Thus, adequacy of accomplishments drops, which through loop B1 causes expected results decline. Meanwhile, in loops B2, B3, and B5, decline in perceived results makes demand decrease, which additionally causes expected results fall. But now the worker is so exhausted that even decrease in demand does not help. The employee

decreases hours worked from time to time to recover. After these short periods his productivity and thus perceived results increase. But expected results are high due to demand, so perceived adequacy is still very low, this again makes him work longer hours. But with such a low level of energy any additional efforts deplete his energy. Thus, eventually the employee can't reach the level he had had before anymore.

Next step is to explore whether increase in intrinsic motivation from time to time during the whole period can solve the problem. The behavior of main variables with shock in motivation can be observed in Figure 4.

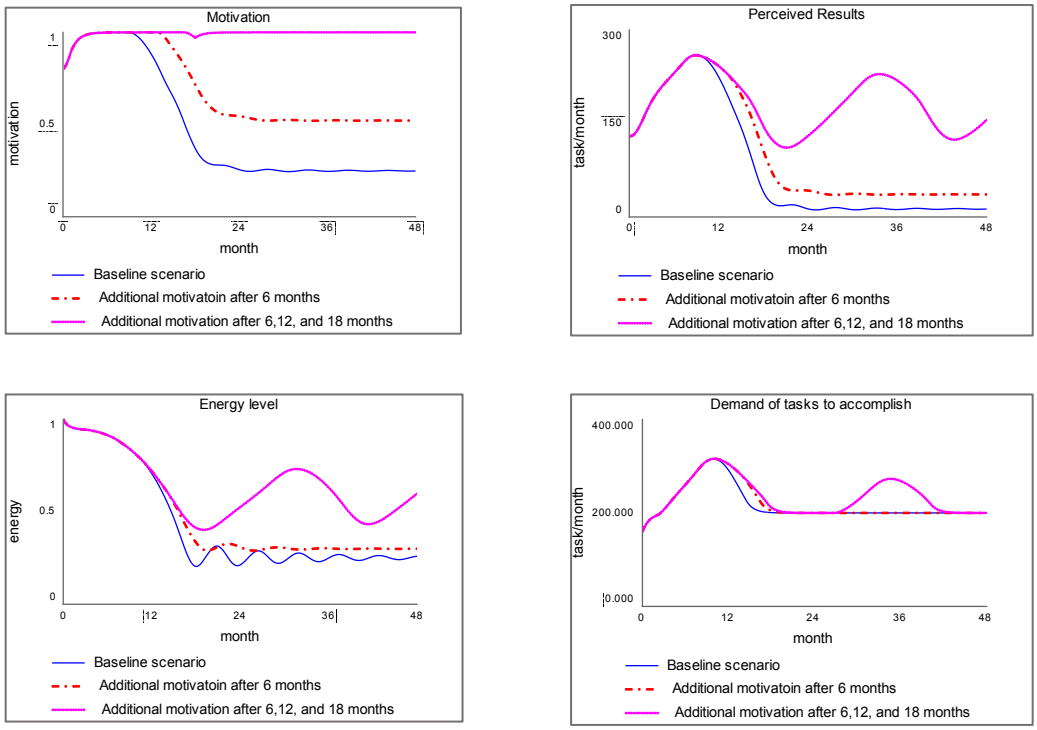

Figure 4. Behavior of the main variables with an increase in motivation

Increase in motivation positively influences the dynamics of the system. Results become higher and energy level is not depleted so much. At the same time, the demand still reaches the maximum point as it does in the baseline scenario. Also, as we see, if motivation grows to its maximum and stays there, then the model produces oscillations.

This can be interpreted as from time to time the employee has to work harder, which depleted his energy, but then he can slow down, relax, and go to work again.

As in Homer's model [1] variable Hours Worked also is important for the solution of the given problem.

Model testing and analysis led to the conclusion that motivation and hours worked can be intervened to stop drastic decline.

There are some of ways to help employees increase their intrinsic motivation and thus increase the results for the whole business or organization: challenging work (in a positive way), ability to choose, opportunity for advancement, mentoring and education, regular feedback, participation in decision making [5].

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