Rochak Kunwar

**Part 1:**

**Name:**

Salary: Salary is usually the pay in the money you get in exchange for your service to an organization. Usually, salary is described as base pay, not the overall benefits and bonuses. The salary is directly proportional to the cost of living, skills of the developer, and the degree one has, as well as the quality of education on has, and the amount of experience in his related field. This needs to be included because of money matters. We cannot live in motivation. In the capitalist society money is motivation and it is proven by history too. If we get good enough pay from the current company it is less likely we will be looking for a different job. We would be more focused on what we are doing. To calculate the salary the measures are pretty simple. We can check for sites like glass door where people share their information like job title their pay, location, etc. To rank based on salary in even simpler; based on the amount of money they get as a salary. This may bring sometimes a problem when we see salary as a base pay because some of the CEO and lead engineers are paid in bonus and very less or not at all in base pay. So in some cases, it needs to be adjusted.

Experience: Experience is the degree one is used to with something. It doesn’t have to be in a skilled area. The chef has 20 years of experience in cooking food; here the measure in years of working. It doesn’t describe if he worked part-time or more than 40 hours a week. Some variables that affect the experience are the quality of the job he did, amount of work he did in the previous job, what was the project he was involved in, how he helped his team, and how he was important in company success. It is a very important factor because it helps to fix the problem faster and makes work smooth and faster. An experienced program can predict where the error might occur while coding the system while inexperience programmer will fix it only after the error has occurred. The experienced programmer has already been through such situation so he is more aware of possible error that can happen. Also, the experienced developer tends to have diverse skills than the recent college graduate. Some of the measures to calculate experience can be the amount of time he spent working may be years, hours, months, etc. It can also be calculated based on the amount of credit he studied; in some countries study can be counted as experience as immigration points, a number of projects completed, etc.

Motivation: Motivation is the reason for doing or not doing something. The higher motivation for good often leads to higher productivity. Motivation by the feeling of competition can be good as well as bad. It is good because productivity increases and work is done faster but it may not always result in the best product. The variable that affects motivation can be salary, benefits, social life at work, the goal of the project, project relation with your interest, etc. It is very important while determining the productivity of a worker because the worker who is forced to work directly or indirectly is not going to be productive than the worker who is self-motivated. Let take an example of the computer science student who is working on the project related to business, politics, and arts. I am sure very few computer science students will be interested in arts as in most cases its totally unrelated branch. Those CS students are highly likely to underperform in arts project as compared to politics and business. What I am trying to say is there is a lot of variables that affect motivation which is very important for worker’s better productivity. Some measure of motivation can be counting of people suffering from anxiety in the workplace, involvement in group discussion, and contribution in a group.

Training: Training is the action of teaching a person some skills that can affect his productivity in that specific task. The variable that affect training is time trained, trainer, the motivation of the trainee, the skills one is trying to learn, etc. It is important in measuring productivity because the right training is very important to perform the task. For example students, they graduate from college but a lot of us are not ready for the specific task we do in the industry so we need the training to perform that task efficiently. The training is a vital part in shaping the workers in a company. The measure can be the type of skills, amount of time he was trained, in what detailed he was trained, etc.

Code Reuse: Code Reusability is the reusing of already written code for creating something new. A library is a good example of code reusability. The variables that can effects code reusability are the programming language used, what task we want to perform, project type, the customer (like government or private). It is very important because the library makes our job really easy. It is just like having a worker who does more than half your job for free in no time; it's already there. Eg: Writing a code in java which has a lot of libraries is simpler and faster than writing code in Elisp or C without any library. The code reusability measure can be numbers of the library used, the framework used, the package used, reusing of the code from similar software that was written before, etc.

Types of Project: Projects can be of many times from web development to AI research. It can also be the maintenance or development of feature in the software. There is usually more motivation in creating new software than in maintaining the software. Also, adding feature and creating totally new software demands for higher skills and training. This is very important in determining the productivity of worker because adding and creating something new motivated people. It is also more work than just maintenance. The variable that determines the types of project are: either the job is maintenance or adding of feature, either it’s a research/theory or application based. The factors can be measured with the help of branching:- estimating each branch/small project is maintenance or building a new feature. It can also be measured based on estimating each branch/subproject as more theory/research-based or application development.

**Part 2: Grouping of factors**

Group 1: Salary, Motivation, Types of Project

Salary drives motivation.

Types of the project drive motivation.

Motivation is affected by types of project the worker gets to work in.

Group 2: Experience, Training

A lot of time experience is affected by the quality and types of training one get.

Group 3: Code Reusability

It is different than any other factors in the listing. But it for sure affects the productivity of a worker.

**Part 3: Model**

Our goal here is come up with the equation that can determine the productivity of a worker based on the factors. Here, we will rank our factors according to their effectiveness in predicting workers productivity. I decided to take a survey on it I am asking three girls in the construction department to rank all these 5 categories. Based on the position we put for each factor I will score their importance in determining the productivity:

Here are the results after the survey:

Four different ranking list

1. Training
2. Code Reusability
3. Salary
4. Experience
5. Types of Project
6. Motivation
7. Motivation
8. Experience
9. Salary
10. Training
11. Code Reusability
12. Type of Project
13. Motivation
14. Salary
15. Training
16. Types of Project
17. Code Reusability
18. Experience
19. Experience
20. Motivation
21. Training
22. Salary
23. Code Reusability
24. Type of Project

* The survey is taken in a different form so the one participant didn’t know others choice.
* The first factor will get 60 pts, 2nd – 50, 3rd – 40 and so on.

The points collected by each factor are listed below after calculation. The calculation is not shown here though.

Training: 170 pts (T) – 20%

Code Reusability: 110 pts (CR) – 13%

Salary :160 pts (S) – 19%

Experience: 150 pts (E) – 18%

Types of Project : 70 pts (TP) – 8.5%

Motivation: 180 pts (M) – 21.5

Total points: 840 pts

The equation that I am coming up with is a linear equation and all have a positive impact on productivity. I didn’t have the option of negative and neutral factors. The different factors have different percent of influence in driving the productivity of a worker. And the equation is given below.

Productivity = (20T + 13CR + 19S + 18E + 8.5TP + 21.5M) / 100

From the equation, we can see that when we have to compromise some factors because of some constraints then we can still achieve a similar level of productivity by losing the productivity of factors with less value over the productivity of factors of high value.