

You Get What You Measure

You and Your Research

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Outline

- YOU GET WHAT YOU MEASURE
- YOU AND YOUR RESEARCH

You Get What You Measure

- The way we measure things controls what happens.

Popular Example :

Bottom Line Selection for Profit and Loss of Company

- If the company is successful and If company starts with 95% rating
 - No place for improvement, therefore play safe.
- If the rating of 50% is chosen, then it would be more balanced.
 - Company can start taking risks instead of playing safe.
- If risk taking wanted to be encouraged,
 - Rating of 20% can be chosen.

You Get What You Measure

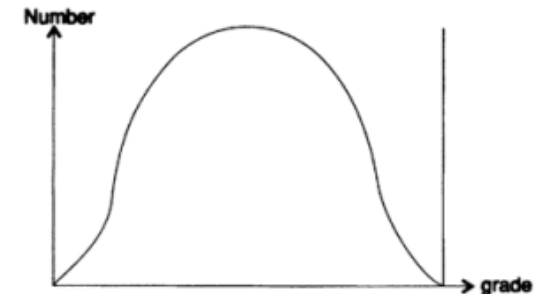
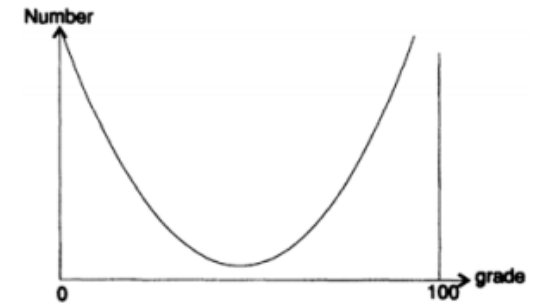
- There are both hard and soft measurements
 - Hard -> height, weight
 - Soft -> social attitudes
- We tend to select hard firm measurements
 - In the long run soft measurements may be more relevant.
- Accuracy of measurement tends to get confused with relevance of measurement.
 - The accuracy of measurement does not mean it has to be done.
 - Instead the measurement with more relevance should be done.

For Example :

- Exams on schools measure training instead of education.

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- Another effect of measurement can be seen in grading system.
- If the class is known, any grade distribution can be obtained.
- If exam is uniformly hard,
 - Then, each student tend to get high or low grades
- If few easy, many moderately hard and a few very hard questions are asked,
 - Then, normal distribution is obtained
- This is another example of effect of measurement on what we get.



You Get What You Measure

- In the long run, the choice of measurement system has effects on the entire system.
- Although wrong choice of measurement system has side effects,
 - Some kind of measurement has to be done.
- Using correct scale is also problem.

For Example :

- Earthquakes are measured with Richter scale which is log of the estimated energy.
 - There are many 1 and 2 scale earthquakes and few really large such as 7 and 8
 - So why are we using Richter scale ?

You Get What You Measure

- In the long run, the **choice of measurement system** has effects on the entire system.
- The **popularity of a form of measurement** has little relationship to its **accuracy or relevance to the organization**.

- In all organizations, each person **bending things** so they themselves will look good!
 - - The only hope of top management level : **Weak law of large numbers**
 - - If the whole organization is working together to **fool the top**, there is little the top can do about it.
 - - So, be conscious about this and stay a day later or come a day earlier, to check whether things are as reported or not ?!

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- There is some **customary practice** with the personnel.

For example:

- - Were the computing machines we were supposed to be shipping **actually on the loading dock, or were they mythical?**
- - at the end of each quarter the machines to be shipped were really shipped but:
- - **Often by the process of scavenging the later machines on the production line**
- - which cause next few weeks were spent in getting the scavenged machines back to proper state.

You Get What You Measure

- What at one level regarded as one thing, is **differently regarded** at a higher level

For example:

- -**Evaluations of capability** of the organization at one level are interpreted as **probabilities** at a higher level!
- - **why does this happen?** Lower level cannot deliver what the higher one wants and hence delivers what it can do => So, the higher level willfully chooses to alter the meaning of the reports.

You Get What You Measure

Conclusion:

- Measurement can be done !

- You have to think about the question of the **relevance and effects** of a form of measurement before choosing new measurements to use in organization.

- Increasing **power of computers** to automatically monitor things
- Inevitable **changes** that will come in the future

=> **New measuring systems will come into use**

You Get What You Measure

- As the last example of measurement
 - - The **programming effort** is often measured by **the number of lines of code**
 - => **Coder's point of view:** there is absolutely no reason to try to clean up a piece of code.
 - => **Productivity scale point of view:** there is no reason to leave the excess instructions in there.
 - **So, the measure used influences the result** in ways which are detrimental to the whole system!
 - It establishes **habits** which at a later time are hard to remove.

Chapter 30

You and Your Research

You and Your Research

- this chapter gives kind of summary of entire book

Why this is important ???

- each of us has only one life to lead

- 1. It is worth trying to accomplish the goals you set yourself**
- 2. It is worth setting yourself high goals**

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- Yes, I would like to do first class work, If hamming could, then why not me ?

Our society frowns on those who say this loudly, but we must say this to ourselves.

What we consider first class work is up to us:

- We must pick our goals, but make them high

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- **Psychologically**

- Believing in **LUCK** makes people lazy!

Pasteur's remark : **“Luck favors the prepared mind”**

1. It admits that there is an element of luck
2. Claims to a great extent it is up to you: You prepare yourself to succeed or not

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- If it were mainly luck then **great things** should not tend to be done **repeatedly** by the same people.
- Einstein, Newton, Edison ...

For example:

Edison said: genius was **99% perspiration and 1% inspiration**

Hard work applied for long years => creative act

Rarely it can be handed to you without any serious effort on your part

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- Belief that **you can do important things !**
- If you do not work on important problems how can you expect to do important work?
 - Most scientists spend most of their time working on things they believe are not important nor are they likely to lead to important things.
 - **“Choose a job you love, and you will never have to work a day in your life.”** Confucius

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- **Confidence in yourself or “Courage”** is essential property
- **courage or confidences is a property to develop in yourself .**
 - Just look at your **successes** and pay less attentions to **failures** that you are usually advised to do in the expression.
- **“Learn from you mistakes”**

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- Age is a factor **physicists and mathematicians** worry about.
- They may continue to do good work all their lives, but what society ends up **valuing most** is almost always **their earliest great work**.
- At most cases they think that **they can only work on important problems**
- **Not that you should merely work on random things, but on small things which seem to you to have the possibility of future growth!**

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- Great people tolerate *ambiguity*
 - both believe and disbelieve at the same time
- Doing the job with *style* is important
- Don't become indispensable

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- Selling your ideas;
 - Giving formal presentations,
 - Producing written reports,
 - Master the art of informal presentations as they happen to occur
- Change does not mean progress, but progress requires change.
- 'The unexamined life is not worth living' - Socrates

THANK YOU FOR LISTENING!
