



## Measuring effort in service organisations

Tarun Agarwal

July 2011

## CONTENTS

<b>EXECUTIVE SUMMARY.....</b>	<b>3</b>
<b>EFFORT MANAGEMENT .....</b>	<b>3</b>
SERVICES .....	3
EFFORT .....	3
WORK ACTIVITY BREAKDOWN .....	4
EFFORT MEASUREMENT VS. EMPLOYEE MONITORING .....	4
<b>BENEFITS OF EFFORT MEASUREMENT.....</b>	<b>5</b>
BEHAVIOURAL CHANGE .....	5
CAPACITY UTILISATION.....	5
CAPACITY PLANNING .....	5
PRODUCTIVITY MANAGEMENT .....	5
TIME-DRIVEN ACTIVITY-BASED COSTING / RESOURCE CONSUMPTION ACCOUNTING .....	5
EMPLOYEE EVALUATION.....	5
<b>IMPACT .....</b>	<b>5</b>
EMPLOYEES.....	5
MANAGEMENT .....	5
<b>APPENDIX .....</b>	<b>6</b>
EFFICIENCY.....	6
EFFECTIVENESS .....	6
PRODUCTIVITY.....	6
PROFITABILITY .....	6
PERFORMANCE .....	6
TRIPLE-P MODEL .....	6
<b>REFERENCES .....</b>	<b>6</b>

## EXECUTIVE SUMMARY

This white paper provides an evaluation of the need to measure effort in service organisations. This evaluation looks at the current problems of these organisations and the effect of effort measurement on their problems. The study shows that key metrics such as productivity, profitability and performance are based on output without taking into consideration the input or effort aspect. This is because inputs or effort in services have traditionally been difficult to measure. Recent technology advances have removed this barrier. The study draws attention to the fact that measuring effort provides the missing data to allow the organisation to take informed decisions by:

- measuring capacity utilisation and productivity with higher accuracy,
- giving capacity planning a scientific edge,
- improving and yet simplifying the process of costing for current or future services,
- increasing profitability,
- mitigating the subjectivity of employee performance evaluation and
- setting the ground for a transparent rewards and penalty program.

enabling by information technology. For the purpose of this article, the following three types of service organisations have been considered:

- information technology (IT) service providers
- IT-enabled service providers
- consulting service providers

As the sector continues to mature, there are new demands on the management of such organisations; higher customer expectations, employee transparency and a constant pressure on profitability.

## EFFORT

In order to appreciate the various problems of a service organisation, it is essential to understand the concept of a service organisation. A service organisation can be depicted as in Figure 1 below.

The Workforce applies its time to tasks using the facilities and infrastructure provided by the Management to generate revenue. The Management remunerates the Workforce.

Time is not the sole input of the Workforce. Input can be in the form of ideas, behaviour, contribution to work environment and so on. Similarly, revenue generation is not the only output in an organisation as it assumes the form of production volumes, brand building, intellectual property, etc. However, the primary measurable **Input** (or **Effort**) is generally believed to be **Time** (every country regulates work hours, all employers maintain attendance) and the most obvious **Output** is a completed task, what we shall call a **Work Unit**.

Work units have been measured with increasing granularity by production systems, operations systems, project management systems, workflow management systems, etc. Time has been more difficult to measure. While it has been a long-maintained practice of service companies to get their employees to declare how their work time was spent, automatic capture of this information has faced technological hurdles. Current technology however allows automated recording of the activity on

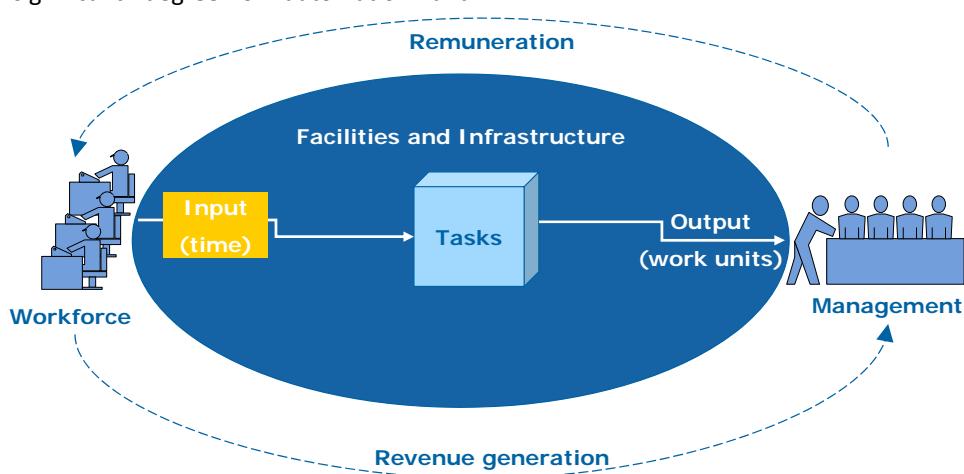


Figure 1 : Service Organisation

individual workstations.

### WORK ACTIVITY BREAKDOWN

The primary input in the service industry is human resource. As mentioned above, the workforce utilises the collective resources of the organisation to work on a task and generate an output. While organisations mandate the quantity of time the workforce should spend at work, qualifying this time was a challenge until recently. Technology has now addressed this challenge for environments where the service activity is IT-enabled, i.e. a majority of the work is done using computers.

As represented in Figure 2, in IT-enabled environments, the quality of time of an individual employee can be divided into activity (employee is working on the computer), breaks (employee is away from the computer) and idle time (employee is on the computer but there is absence of activity). Activity would cover all possible activity whether or not it adds value to the organisation. The organisation needs to define standards for time spent on activities that do not add value but are nevertheless essential, such as lunch, personal breaks and so on. The purpose of these standards is to serve as a reference point for the actual metrics. For example, if the recorded measures exceed the standards, the variance would be considered resource wastage. Conversely, where the recorded measures fall below the standards to a marked extent, there are risks attached, such as a negative impact on the work-life balance of employees.

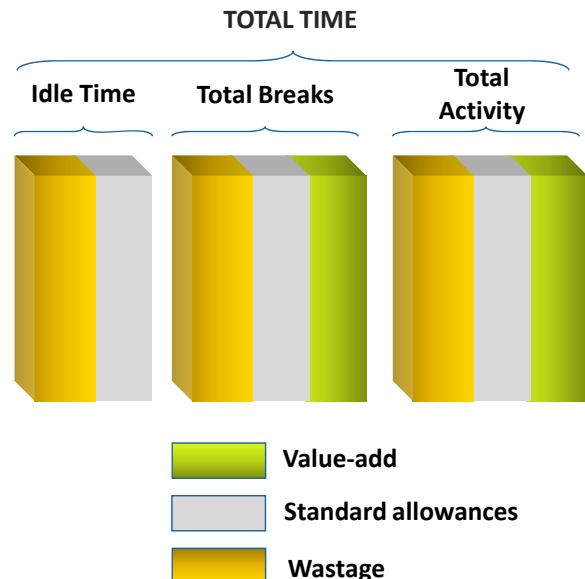


Figure 2 : Work Activity Breakdown

### EFFORT MEASUREMENT VS. EMPLOYEE MONITORING

Time is a common factor between effort measurement and employee monitoring. However, this is the only common point and it is therefore essential to differentiate between Effort measurement and employee monitoring (see Table 1 : Effort Measurement vs. Employee Monitoring).

Typical features	Effort measurement	Employee monitoring
<b>Approach</b>	Monitoring the use of all the workstation and server-based resources provided by the company to the employee to execute a set of tasks that form part of the employee's work objectives	Monitoring the electronic communications and internet usage of the employee
<b>Objective</b>	Measure effort of the human resource for accurate metrics on efficiency, effectiveness, productivity, and profitability.	Employee supervision and 'policing' with declarative time sheets and intrusive screenshots
<b>Principal Outcomes</b>	Behavioural change driven by internal competition Capacity Utilisation and Planning Productivity Management Employee Evaluation Time-Driven Activity-Based Costing Resource Consumption Accounting	Behavioural change driven by fear and anxiety Security compliance* by employees  *Screenshots actually constitute a security risk, if accessible
<b>Data collection</b>	Automated	Manual and declarative
<b>Dependency on employee</b>	Limited to selection of time away from the workstation	Very high due to declarative nature of data collection
<b>Employee privacy</b>	Strictly non-intrusive with employee privacy respected – no screenshots, no data collection on field-level entry	Highly intrusive – screenshots, screenshot videos, email content, internet usage blocking
<b>Data security</b>	No process data captured	Process data collected (screenshots, etc.) raising security concerns

Table 1 : Effort Measurement vs. Employee Monitoring

## BENEFITS OF EFFORT MEASUREMENT

Besides the direct gains of accounting for the consumption of resources, effort measurement addresses other management problems. There is strong interest today in measuring the dynamic correlation of actual input versus actual output (as opposed to the traditional approach of correlating actual output with standard input, if at all). This new exercise provides companies with accurate, real-time and historical information on their [2E3P](#) – the [Efficiency](#) and [Effectiveness](#) of their resources and thus leaks in [Productivity](#) and its impact on [Profitability](#) and overall [Performance](#) (refer [Appendix](#)). Effort measurement drives the 2E3P model. This model is derived from Stefan Tangen's Triple-P model and has been adapted to the service sector to give the following benefits:

### BEHAVIOURAL CHANGE

Effort measurement is an effective driver for behavioural change in case of an open implementation. The employees are given access to their data along with a comparison with the team as a whole. The employees are thus empowered by being made aware of their action points without a first-level involvement of the manager giving the organisation significant motivational benefits.

### CAPACITY UTILISATION

Competitive environments oblige organisations to measure the extent to which their available capacity has been consumed and what part of it was done so usefully. Effort measurement clearly identifies idle resources and serves to recover the wastage. This gives the organisation a view of the capacity still available to process additional work units.

### CAPACITY PLANNING

Forecasting is an exercise with inherent potential for inaccuracy. The practitioner seeks to improve accuracy by reducing assumptions wherever possible. Since standard cycle times cannot accurately represent the actual cycle time for each employee, substituting them with actual cycle times (allowing for team average, etc.) is a step forward in enhancing the capacity planning model.

### PRODUCTIVITY MANAGEMENT

Output is part of productivity measurement which involves correlation of the input with the output. Output needs to be therefore seen against the effort that went into generating it. This correlation provides an accurate measure of the productivity of the employee / team / organisation. Effort measurement gives a window to any leakages in productivity.

### TIME-DRIVEN ACTIVITY-BASED COSTING / RESOURCE CONSUMPTION ACCOUNTING

The true cost of an activity or the consumption of a resource is intricately linked to the concept of idle resources. The cost of the resources idle beyond acceptable standards should not be ascribed to a revenue-generation activity. With effort measurement, the TDABC model can base activity cost on real effort instead of standards.

Organisations wishing to work with the Resource Consumption Accounting model will find effort measurement an absolute must to create the model.

### EMPLOYEE EVALUATION

A significant amount of subjectivity in employee performance evaluation is removed with an open implementation of effort measurement. The correlated data is available with the employee and the management to take a fact-based decision on the employee's performance. The human resource management team can more effectively design reward and penalty models on this basis.

## IMPACT

### EMPLOYEES

The primary impact of effort measurement is to provide employees an objective evaluation of their individual 2E3P, in relation to the team as a whole. Employees get the advantage of seeing their achievements highlighted. Their training requirements are also derived from actual and not perceived needs. Since managers and their chain of command can view the 2E3P of individual team members, subjectivity is taken away from employee performance evaluation. This makes it a well-rounded transparent process.

### MANAGEMENT

Besides the benefits listed above, there are other operational impacts on management. Physical presence was traditionally important to measure the effort of each team member. Automated effort measurement ensures that the team members can work with little or no physical supervision. The managers are thus allowed additional time to add value to the organisation. This also means that managers can control a larger team and evaluate performance periodically with reduced effort. The organisation's skill matrix can be enhanced to include the new effort and productivity metrics. This eases planning for future projects and processes.

## APPENDIX

Effort measurement drives the 2E3P model. This model is derived from Stefan Tangen's Triple-P model.

### EFFICIENCY

"Efficiency means how much cost is expended compared with the minimum cost level that is theoretically required to run the desired operations in a given system." – Jackson, 2000

"Efficiency = ideal system dependent time/total time" – Jackson, 2000

### EFFECTIVENESS

"Effectiveness in manufacturing can be viewed as to what extent the cost is used to create revenues." – Jackson, 2000

"Effectiveness = value added time/ideal system dependent time" – Jackson, 2000

### PRODUCTIVITY

"Productivity means how much and how well we produce from the resources used. If we produce more or better goods from the same resources, we increase productivity. Or if we produce the same goods from lesser resources, we also increase productivity. By "resources", we mean all human and physical resources, i.e. the people who produce the goods or provide the services, and the assets with which the people can produce the goods or provide the services." – Bernolak, 1997

"Productivity = efficiency \* effectiveness = value added time/total time" - Jackson and Petersson, 1999

### PROFITABILITY

"Profitability, on the other hand, is defined as output quantities times output unit price per input quantities times unit costs." -Bernolak, 1997

"Profitability = output x unit price / input x unit cost"  
– Bernolak, 1997

### PERFORMANCE

"Performance is the umbrella term of excellence and includes profitability and productivity as well as other non-cost factors such as quality, speed, delivery and flexibility." – Stefan Tangen, 2003

### TRIPLE-P MODEL

The inter-relationship between the various terms is well-defined the Triple-P model in **Error! Reference source not found.** below (also see Tangen, 2002a,b; Grünberg, 2004).

Productivity is the central core of the triple P-model and has a straightforward operational definition of productivity as the relation between output quantity (i.e. correctly generated output which fulfil their specifications) and input quantity (i.e. all resources that are consumed in the transformation process). It is argued that even though it is difficult to measure different quantities by the same standard, the concept of productivity is purely a physical phenomenon and must therefore be defined as one. Profitability is also seen as a relationship between output and input, but it is a monetary relationship in which the influences of price-factors (i.e. price recovery - ratio of unit prices related to unit costs) are included. Performance is the umbrella term of excellence and includes profitability and productivity as well as other non-cost factors such as quality, speed, delivery and flexibility. The two terms effectiveness and efficiency are somewhat cross-functional when it comes to the other three terms. Effectiveness represents the degree to which desired results are achieved; Efficiency represents how well the resources of the transformation process are utilised.

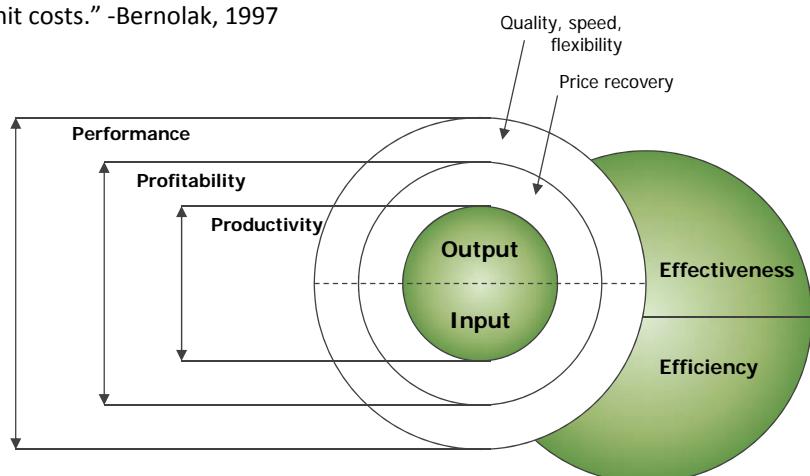


Figure 3 : Triple-P Model

## REFERENCES

---

Stefan Tangen, "Demystifying productivity and performance", *International Journal of Productivity and Performance Management*, (August 2004), pp. 34-46.

Thomas Grünberg, "Performance improvement – Towards a method for finding and prioritising potential improvement areas in manufacturing operations" (2004), 53, 1/2, pp. 52-71.

Jonas Rutkauskas, Eimené Paulavičienė, "Concept of Productivity in Service Sector", *Engineering Economics*, (2005), No 3 (43), pp. 29-34.

Robin L. Wakefield, "Employee Monitoring and Surveillance—The Growing Trend", *Information Systems Audit and Control Association*, (2004) Volume 1.

Ann Bevitt, Marian Waldmann, Teresa Basile, Peter Edlind and Gordon Milner, Morrison & Foerster "Monitoring employees: striking a balance", *Labour and Employee Benefits*, (2007/08), Volume 1, pp. 53-59.

Gail Lasprogata, Nancy J. King, Sukanya Pillay, "Regulation of Electronic Employee Monitoring: Identifying Fundamental Principles of Employee Privacy through a Comparative Study of Data Privacy Legislation in the European Union, United

States and Canada", *Stanford Technology Law Review*, STAN. TECH. L. REV. 4,  
[http://stlr.stanford.edu/STLR/Articles/04\\_STLR\\_4](http://stlr.stanford.edu/STLR/Articles/04_STLR_4).

Roberst S. Kaplan, Steven Anderson, "Time-Driven Activity-Based Costing", *Harvard Business School Press* (2007).

Michael S.C. Tse, Maleen Z. Gong, "Recognition of Idle Resources in Time-Driven Activity-Based Costing and Resource Consumption Accounting Models", *Journal of Applied Management Accounting Research*, (2009), Number 2, pp. 41-54.

Ciaran McGowan, "Time-Driven Activity-Based Costing, A new way to drive profitability" *Accountancy Ireland*, (December 2009), pp. 60-61.

Michel Gervais, Charles Ducrocq, Yves Levant, "Time Driven Activity Based Costing: New Wine, or Just New Bottles?", La place de la dimension européenne dans la Comptabilité Contrôle Audit, France (2009)

CIA - The World Factbook,  
<https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html>