Handbook for SME Productivity Measurement and Analysis for NPOs

ASIAN PRODUCTIVITY ORGANIZATION

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INTRODUCTION AND BACKGROUND

Small and medium enterprises (SMEs) play an increasingly important role in Asian economies in terms of their contributions to GDP and employment, and remain the core engines for productivity and economic growth. The Asian Productivity Organization (APO) recognizes the importance of enhancing and monitoring the progress of SME performance, and facilitating the sharing of productivity performances and best practices among SMEs within the APO member economies.

For this purpose, it was established that SMEs should embrace productivity measurement as an important process for improving their productivity, and for achieving sustained business growth and competitiveness.

In November 2013, the Workshop on SMEs Productivity Measurement and Analysis for NPOs was organized in Singapore. The key objectives of the 2013 APO Workshop (Project Code: 13-RP-02-GE-WSP-B) were:

a) To enhance understanding of productivity concepts and measurement among national productivity organization (NPO) managers and consultants

b) To review the tools and techniques for SME productivity measurement used by some NPOs and related organizations

c) To identify and recommend a suitable SME productivity measurement system for NPOs

A total of 16 participants representing 16 NPOs from APO member countries attended the workshop to address the difficulty in measuring the firm-level productivity of SMEs. The participants collectively agreed that while NPOs shared a common understanding of labor and capital productivity, they differed largely on measurements of other indicators. Due to those differences, the participants proposed that the APO establish a common foundation of SME productivity measurement to allow SMEs and NPOs to measure and analyze firm-level productivity in APO member countries.

The APO Handbook for SME Productivity Measurement and Analysis for NPOs is thus a follow-up initiative based on the suggestions and recommendations from participants in the APO Workshop on SME Productivity Measurement and Analysis for NPOs.

REVIEW OF PRODUCTIVITY CONCEPTS

In a highly competitive environment, SMEs from both the manufacturing and service sectors have to focus on productivity to meet the requirements of customers; they must nurture a strong productivity mindset and embrace continuous productivity improvement on a company-wide basis.

> *"Productivity is, above all, a state of mind. It is an attitude that seeks the continuous improvement of what exists. It is a conviction that one can do better today than yesterday, and that tomorrow will be better than today."*
>
> *European Productivity Agency, Rome Conference, 1959*

Productivity is thus critical for the long-term competitiveness and profitability of SMEs, as well as their survival. It requires constant effort to adapt economic activities to the ever-changing business conditions to create value for all stakeholders based on the process approach.

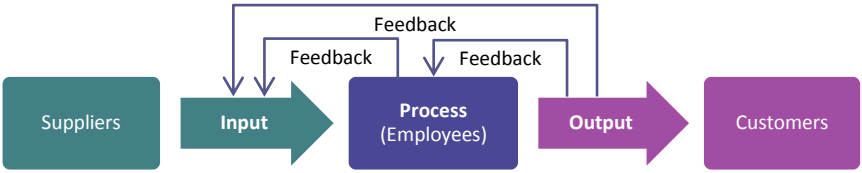

Figure 1. The Process Approach

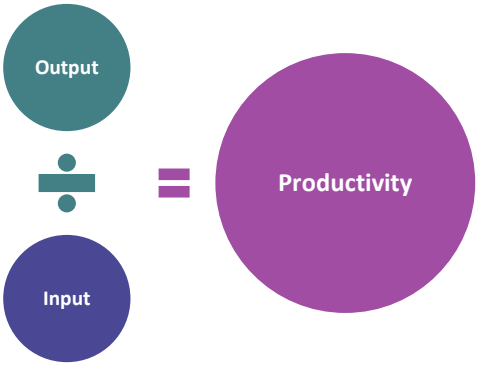

Figure 2. Definition of Productivity

Productivity is the relationship between the quantity of output and the quantity of input used to generate said output. It is basically the measure of the effectiveness and efficiency of the SMEs in generating output using the resources available.

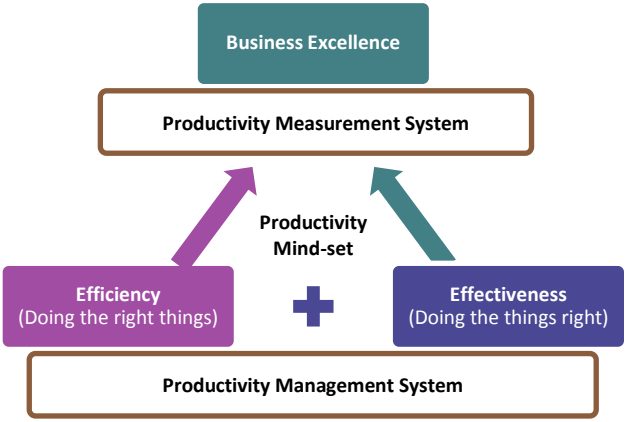

Figure 3. Productivity Management and Measurement Systems

By laying a strong foundation of productivity, SMEs will be able to enhance their organizational systems and processes to achieve sustained business excellence in the long run.

In the quest to achieve business excellence, SMEs need to adopt a holistic productivity management system to manage their organization's productivity journey in a systematic manner. An example of a productivity management system is as follows:

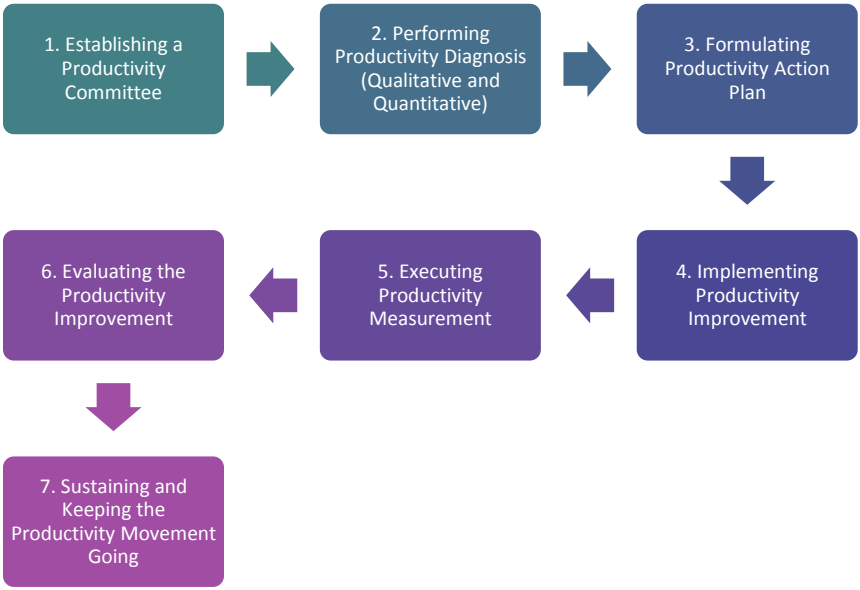

Figure 4. Productivity Management System

The Value Added (VA) Concept

VA is used to measure the wealth created by the organization through its production and/or service processes, which can then be distributed to the various stakeholders, to sustain its business operations. It is a key input for computing key productivity indicators such as labor productivity, capital productivity and labor cost competitiveness.

SMEs can use data from their financial statements to compute VA using the following methods:

a) Subtraction Method (Wealth Creation)

Value Added = Sales – Bought-in Materials & Services

b) Addition Method (Wealth Distribution)

Labor Cost + Depreciation + Interest + Profit + Tax

Computation of VA using either the subtraction or addition method will give the same result.

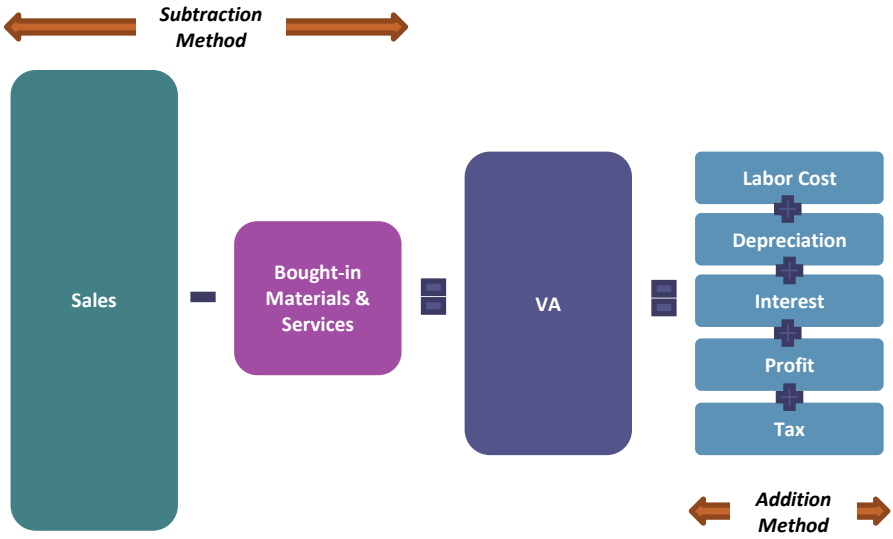

Figure 5. Computation of VA

Enhancing VA will give rise to higher profits that can be shared with employees through dividends, and with the SMEs as retained earnings for sustained business growth.

IMPORTANCE OF PRODUCTIVITY MEASUREMENT

In order to ensure effective management of business processes, SMEs need to establish and implement an appropriate productivity measurement system to provide information on how effectively and efficiently they manage their resources. This will help them determine if their productivity effort is progressing well.

"Without productivity objectives,
a business does not have direction.

Without productivity measurement,
a business does not have control."

Peter Drucker

"Measurement is the first step that leads to
control and eventually to improvement.
If you can't measure something, you can't understand it.
If you can't understand it, you can't control it.
If you can't control it, you can't improve it."

James Harrington

Productivity measurement is thus an important communication tool to share current performances relative to the goals and/or standards that the SMEs have established. It provides an objective basis to recognize and reward both individual and team contributions to the productivity effort in the company through the application of a productivity gainsharing scheme. Moreover, productivity measurement could also help to identify the learning and development needs of employees so that the competency of the workforce can be further enhanced.

HOW TO MEASURE PRODUCTIVITY

Productivity measurement is basically a process of identifying the appropriate measures or metrics to be used, and the computation of their results to determine the effectiveness and efficiency of the resources used.

As explained earlier, productivity = output ÷ input. Thus, measurement of both the output and input, using the productivity levers, are keys to enhancing productivity.

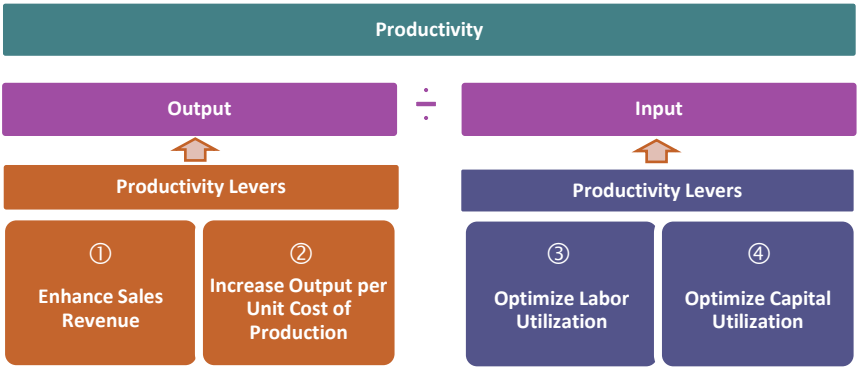

Figure 6. The Four Productivity Levers for Enhancing Productivity

The four productivity levers are:

i) Enhance Sales Revenue (Output)
ii) Increase Output per Unit Cost of Production (Output)
iii) Optimize Labor Utilization (Input)
iv) Optimize Capital Utilization (Input)

Once the productivity levers are established, a structured approach could be adopted to measure the key productivity indicators and productivity indicators in each of the productivity levers. The key steps of an effective productivity measurement system are as follows:

Figure 7. Productivity Measurement System

ESTABLISHING A PRODUCTIVITY MEASUREMENT SYSTEM

With a productivity measurement system, SMEs can execute and compute their performance results in both quantitative and qualitative terms, thereby gaining a complete understanding of their productivity improvement status over time.

Quantitative Productivity Measurement

In order to improve the productivity level and growth rates, productivity indicators in each of the four productivity levers need to be established. The use of a comprehensive set of productivity indicators will enable the SMEs to better manage and improve their productivity performance over time. Productivity indicators used to measure productivity are inter-related and used at different levels (national, organizational and operational).

Figure 8. Productivity Indicators at the Various Levels

To understand the SME's overall productivity performance, key performance indicators and performance indicators have to be established for all four productivity levers to measure organizational and operational performance respectively.

Measurement of Output

Table 1. Productivity Lever #1: Enhance Sales Revenue

Productivity Lever #1: Enhance Sales Revenue				
Organizational	**S/N**	**Key Performance Indicators**	**What it measures**	**Formula**
	1.	Sales per Employee	Efficiency and effectiveness of the marketing strategy	VA ÷ Sales
Operational	**S/N**	**Performance Indicators**	**What it measures**	**Formula**
	1.	Customer Satisfaction Index	Satisfaction with company's products/services	Calculated from a series of weighted indicators linked to service standards, perceived value, perceived quality and other indexes
	2.	Complaint Ratio	Level of company's product/service performance	Number of customer complaints ÷ Total number of customers
	3.	Compliment Ratio	Level of company's product/service performance	Number of customer compliments ÷ Total number of customers
	4.	Customer Retention	Customer loyalty	a) No. of regular customers over the past year ÷ Total number of customers
			Value of customer loyalty	b) Value of repeat sales ÷ Total sales
	5.	Sales Growth	The potential of the company to grow	$(Sales_t - Sales_{t-1}) \div Sales_{t-1}$

Table 2. Productivity Lever #2: Improve Output per Unit Cost of Production

Productivity Lever #2: Improve Output per Unit Cost of Production				
Organizational	**S/N**	**Key Performance Indicators**	**What it measures**	**Formula**
	1.	VA-to-Sales Ratio	Proportion of sales created by the organization over and above purchased materials and services	VA ÷ Sales
	2.	Profit Margin	Proportion of sales left to the organization after deducting all costs	EBITDA* ÷ Sales
Operational	**S/N**	**Performance Indicators**	**What it measures**	**Formula**
	1.	Annual Inventory Turns (number of turns per year)	Effectiveness in inventory management of the materials used, e.g., efficient buying practices, inventory cost and quality (obsolescence level)	Cost of goods sold ÷ Average inventory valuation (value of stocks) held during the year
	2.	Defects Rate (Internal)	Effectiveness of the quality management systems	Number of parts/products found to be defective ÷ Total number of parts/products produced or Number of defective parts/products per million parts
	3.	Customer Rejects/Return (External)	The quality of product that does not meet the customer's requirements	Orders rejected ($) ÷ Total orders ($)
	4.	Scrap/Rework Level	Effectiveness in the use of materials	Scrap/ Rework value ÷ Sales revenue
	5.	On-time Delivery to Commitment	The number of deliveries that meet the customers' deadlines	Number of deliveries on time ÷ Total number of deliveries

*EBITDA, earnings before interest, taxes, depreciation, and amortization

Measurement of Input

Table 3. Productivity Lever #3: Optimize Labor Utilization

Productivity Lever #3: Optimize Labor Utilization				
Organizational	**S/N**	**Key Performance Indicators**	**What it measures**	**Formula**
	1.	Labor Productivity	Efficiency and effectiveness of employees in generating VA	VA ÷ Number of Employees
	2.	Labor Cost per Employee	Average remuneration per employee	Labor Cost ÷ Number of employees
	3.	Labor Cost Competitiveness	Efficiency and effectiveness of company in terms of its labor cost	VA ÷ Labor Cost
Operational	**S/N**	**Performance Indicators**	**What it measures**	**Formula**
	1.	Employee Turnover Rate	Overall employee satisfaction level, retention rate and effectiveness of recruitment process	Number of employees resigned ÷ Total number of employees
	2.	Employee Satisfaction Index	Employee morale and engagement level	Calculated from a series of weighted employee measures or indicators
	3.	Employee Participation Rate in Team Activities (%)	Involvement in quality and productivity activities	Number of employees involved in team activities ÷ Total number of employees
	4.	Employee Participation Rate in Suggestion Scheme (%)	Involvement in quality and productivity activities	Number of employee who submitted suggestions ÷ Total number of employees
	5.	Cost Savings from Employee Involvement Activities ($)	Cost savings from projects implemented	Total amount of estimated cost saving from projects
	6.	Training Hours per Employee	Learning and development emphases to enhance employee competencies	Training hours per year ÷ Number of employees
	7.	Training Expenditure/Sales Turnover (%)	Level of investment in employees	Training expenditure ÷ Sales turnover
	8.	Absenteeism Rate	Engagement and morale of employees	Number of absentees ÷ Total number of employees

Table 4. Productivity Lever #4: Optimize Capital Utilization

Productivity Lever #4: Optimize Capital Utilization				
Organizational	**S/N**	**Key Performance Indicators**	**What it measures**	**Formula**
	1.	Capital Productivity	Efficiency and effectiveness of fixed assets in the generation of VA	VA ÷ Fixed Assets
	2.	Sales per Dollar of Capital	Efficiency and effectiveness of fixed assets in the generation of sales	Sales ÷ Fixed assets
Operational	**S/N**	**Performance Indicators**	**What it measures**	**Formula**
	1.	R&D Investment Ratio	The ability of the company to invest in R&D and to innovate	R&D expenditure ÷ Sales
	2.	Capacity Utilization Rate	The extent to which the company uses its installed productive capacity	Actual output ÷ Potential output

The results of each of the key performance indicators can then be compared against the corresponding results from the past year to determine the trend in productivity performance and growth rate within the company. Furthermore, SMEs can compare the computed results with their respective sector and/or national averages for benchmarking purposes and continual improvement.

Qualitative Productivity Analysis

Besides the quantitative productivity measurement, it is also necessary for SMEs to perform qualitative analysis so as to have a total understanding of their productivity status in each of the four productivity levers.

A questionnaire, consisting of five questions for each of the productivity levers, has been developed to assist SMEs in diagnosing their systems and processes to help assess their productivity effort and status. A rating scale of 0-5 is used for each question.

Upon the completion of the qualitative productivity analysis, SMEs can then formulate their respective strategic and action plans to improve their productivity performance in the years ahead.

The table showing the qualitative productivity analysis questionnaire in each of the four productivity levers is as follows:

Table 5. Qualitative Productivity Analysis Questionnaire

Tabulate the score at the end of each productivity lever in accordance with the following system. **0** = None **1** = Some **2** = Some Key **3** = Most Key 4= Most Key **5** = All Key	
A. Productivity Lever #1: Enhance Sales Revenue	
1. We establish sales projections and targets to achieve our sales growth	
2. We formulate marketing strategies to enhance sales revenue	
3. We identify new market segments and their requirements through research and analysis	
4. We regularly analyze and review our product mix in our identified market segments	
5. We constantly improve our product and service quality	
Total:	
B. Productivity Lever #2: Increase Output per Unit Cost of Production	
6. We focus on our key competencies and practice 'best sourcing'	
7. We collaborate with partners and key suppliers to ensure on-time deliveries	
8. We engage in inventory and supply chain management to optimize cost of materials and services	
9. We review and improve business processes to achieve optimal level of operations	
10. We continuously reduce the cost of non-conformance in our operations	
Total:	
C. Productivity Lever #3: Optimize Labor Utilization	
11. We nurture a productivity mindset throughout the company	
12. We train and enhance our employees' skills to perform work effectively	
13. We deploy manpower effectively and flexi-work arrangements to meet demand fluctuations	
14. We implement good management practices and communicate productivity goals to employees	
15. We assess workforce satisfaction level and work attitudes	
Total:	
D. Productivity Lever #4: Optimize Capital Utilization	
16. We utilize appropriate technology to improve our business systems and work processes	
17. We review the effectiveness of machines and equipment in our various processes	
18. We set targets for machine and equipment utilization, and track their results	
19. We review the optimum usage of space and use shared facilities	
20. We adopt a strategy to achieve optimum utilization of capital and R&D Investment	

			Total:
Results of Qualitative Assessment of the Four Productivity Levers From the above assessments, fill in the table below with the scores as follows:			
Productivity Levers	**Own Score (A)**	**Highest Possible Score (B)**	**% (A ÷ B)**
1. Enhance Sales Revenue			
2. Increase Output per Unit Cost of Production			
3. Optimize Labor Utilization			
4. Optimize Capital Utilization			

Less than 40%	**Weak:**	Take immediate actions to improve productivity management and improvement efforts
40% to 70%	**Average:**	Continue to improve productivity management and improvement efforts
Above 70%	**Strong:**	Strive for strategic and continuous improvements to sustain achievements

SUMMARY AND CONCLUSION

It is hoped that this productivity measurement handbook will provide an overall approach for SMEs to enhance and reinforce their productivity efforts, in order to become more competitive and to achieve sustained business growth. Productivity measurement is an important means of providing valuable information on the efficacy of the productivity programs that the SMEs have implemented. It helps facilitate and reinforce a company-wide approach for achieving business goals and objectives.

The use of both qualitative and quantitative productivity data and information provides a comprehensive measurement system that enables SMEs to sustain the systems and processes needed to successfully implement productivity improvement programs.

Successful SMEs can then share and compare their productivity results based on a common set of productivity indicators as set out in each of the four productivity levers. Thereafter, best practices can be learned, adapted and implemented based on the benchmark performance.

It is our hope that this APO handbook for productivity measurement will be a useful reference for SMEs to further enhance the productivity performance in their companies in the years ahead to become highly productive SMEs!

ABOUT THE AUTHOR

George Wong, Managing Director & Principal Consultant of Hoclink Systems & Services, has served as a Chief Expert and Resource Person with the APO for more than 15 years. He is a Certified Productivity Consultant with SPRING Singapore and Japan Productivity Center, and a Certified Management Consultant with the International Council of Management Consulting Institutes.

He has 40 years of corporate and full-time consultancy and training experience in productivity, innovation, business excellence, benchmarking, service excellence, total quality management, lean management, people excellence, and team excellence. In 1985, he was appointed a pioneer Key Productivity Activist (Chairman, Productivity Promotion) by the Singapore National Productivity Board to help promote the productivity movement in Singapore. He has also served as a Singapore Quality Award National Assessor and as a School Excellence Model Assessor.