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# Transfer Prices and Compensation: an Activity-Based Costing Approach in the Telecommunications Industry

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## Abstract

This case study showcases how the introduction of Time-driven Activity based Costing may help to manage product profitability. A division of the telecommunication corporation Y-FI intends to implement Activity Based Costing to improve its product profitability. This also allows the company to incentivize the executives by setting motivating targets and feasible transfer prices. This case is suitable for in class application as well as exam for students in the fields of management, operations, and accounting. At the end of the case, open questions are provided that the lecturer can select based on the level of knowledge of the students. The questions also serve as a basis for discussions that allow to raise the awareness of the students for the limits of linear bonus contracts. The goal of the case is to learn how incentive structures may lead to dysfunctional decisions if not in consent to the business model.

**Keywords:** Product profitability; Activity-based Costing; transfer prices; target setting; incentives; restructuring; case study; teaching notes; shareholder value; customer satisfaction.

## 1. Introduction

Y-FI is a division of the large telecommunication corporation PHONET. Y-FI manufactures two models of routers and charges a transfer price for them to the sales division of PHONET. With every new internet contract, PHONET provides the model "BUG" free of charge to private customers. The model "HORNET" provides better wireless reception than BUG. HORNET is available with new internet contracts for an additional fee that is passed on from PHONET's sales department to Y-FI. The fee is still well below the store price of a comparable router bought without an internet contract.

## 2. Activity-based Costing and Activity-based Management (approx. 40 minutes)

The two support departments of Y-FI (assembly; general factory and machines) allocate their indirect costs to two product

lines (BUG and HORNET) based on the number of units produced and sold (note: the costs are NOT allocated based on revenues!). You work with the head of the division, Charlotte, on the implementation of a new system. Charlotte says that the volume-based costing system applied at the moment does not reflect the resource consumption of producing these two routers correctly. As such, she proposes that you calculate the profitability for BUG and HORNET using time-driven activity based costing (TBABC). You have access to the following data:

Information on the current volume-based costing system			
<i>[in EUR, unless stated otherwise]</i>	BUG	HORNET	Total
Units produced and sold [in units]	40,000	10,000	50,000
Average price [per unit]	70	120	---
<b>Revenue</b>			
Direct material	1,120,000	600,000	1,720,000
Direct labor	84,000	48,000	132,000
<b>Contribution margin</b>			
Assembly			160,000
General factory and machines			1,800,000
<b>Profit</b>			
<i>Return on Sales [in %]</i>			

Additional information for alternative allocation with TDABC				
Cost driver rates	Total cost of support departments [in EUR]	Practical capacity [in h]		Cost driver rate per hour [in EUR]
Assembly	160,000	4,000	labor hours	
General factory and machines	1,800,000	10,000	machine hours	

Resources necessary to build one router		
	BUG	HORNET
Labor hours	0.10	0.15
Machine hours	0.15	0.30

## Required

1. Analyze the profitability of Y-FI and of the two products by calculating the following items: revenues, contribution margins, allocated overhead cost, total profits in EUR and return on sales (RoS)

2. Analyze the profitability of Y-Fi again, this time using TDABC. To do so, calculate the cost driver rates per hour of the two support departments, the new allocated overhead cost, total profits in EUR, and return on sales (RoS).
3. Charlotte asks you if there is something like “negative” idle time. Please elaborate on the reasons and implications.
4. Elaborate on three Activity-based Management initiatives that could improve the profitability of Y-Fi.

### 3. Transfer pricing and managerial implications (approx. 40 minutes)

Charlotte has discovered that business customers are interested in buying the high-performance router HORNET, even if they have another provider than PHONET. Charlotte has to make these additional sales through PHONET’s SALES department. Y-Fi transfers HORNET to the SALES department and SALES sells the routers to business customers. PHONET evaluates each division based on the reported profit of that division. Charlotte calculated the transfer prizes Y-Fi sells the routers to PHONET with the costs plus method. With a list price for HORNET of 194 EUR, the transfer prize calculates at the variable costs of 104 EUR plus 15% to a total of 119.60 EUR per unit. The distribution cost for SALES are 20 EUR. One router has the machining time of 0.25 hours and the practical limit of capacity for the machines to produce HORNET is 4.000h per period – this cannot be increased. Y-Fi thinks that they can sell 16.000 units of HORNET per period and plans to produce this amount per period.

The engineers of Y-Fi have developed a new router called DRAGONFLY. This new router is based on a modified version of the router HORNET. To produce this router, Y-Fi produces one unit of HORNET and modifies it which required additional costs of 20.90 EUR and an extra 0.07 hours of machining time.

#### Required

1. Argue what the range of transfer prizes can be for HORNET? Please explain your answer (one sentence).
2. Calculate the the minimum wholesale list price for DRAGONFLY if the production of DRAGONFLY if during the modifying process, HORNET could not be produced (remember: the capacity of the machines and the labor cannot be improved).
3. When negotiating the exact transfer prices, Charlotte brings up the “controllability principle”. Briefly define this principle, name two reasons how the principle is breached in practice, and discussone instance where such a breach could be beneficial for a company as a whole.

### 4. Incentive systems (approx. 40 minutes)

PHONET introduces a new variable part to the salary plan of its head of divisions. This variable part functions as an incentive system for the head of divisions to perform better. For the variable part, PHONET chooses to increase the salary

of their head of divisions by 0.6% for every 1 % increase of net operating profit after tax (NOPAT) and the customers' net promoter score (NPS) respectively. But the bonus cannot be negative. For example an increase in NOPAT by 13 % with a simultaneous decrease in NPS by 3 % would leave the head of division with a bonus payment in the amount of 10 percent ( $10\% \times 0.6$ ). PHONET's three telco divisions (Y-FI; CALL; TV) reported the following results:

	Y-FI			CALL			TV		
	2018	2019	% change	2018	2019	% change	2018	2019	% change
Net Operating Profit After Tax (NOPAT) [in million EUR]	20	21.6		14	17.5		5	5.1	
Net Promoter Score (NPS) [indexed 0 to 100]	75	76.5		25	23		99	98.01	
Sum of changes [in %]	-	-		-	-		-	-	
Bonus of salary [in %]	-	-		-	-		-	-	

## Required

1. Calculate the bonus (in % of salary) by complete the table above.
2. Compare the results over the divisions to discuss two interactions between NOPAT and NPS.
3. After your analysis, you come to the conclusion that the bonus system does not align with the overall goals of PHONET. Elaborate on the system's three most important shortcomings.
4. Charlotte conjectures that a main flaw of the current bonus system is the definition of target achievements, i.e., the non-penalty for negative performance, and the unlimited, linear relationship (due to the % change) between achievement and bonus. Suggest two alternatives to the current definition of achievement. For each alternative, also explain one advantage (for either the executive or the company) that your alternative has over the current system.

## 5. Discussion of the case

*A suggested solution is available from the author upon request.*

## 6. References

- Albertsen, O.A., & Lueg, R., "The Balanced Scorecard's missing link to compensation: a literature review and an agenda for future research", Journal of Accounting and Organizational Change 10 (4), 2014, 431-465.
- Atkinson, A. A., Kaplan, R. S., Matsumura, E. M., & Young, S. M., Management Accounting, International Edition, Pearson, New Jersey, NJ, 2011.
- Cooper, R., & Kaplan, R. S., "Profit priorities from Activity-based Costing", Harvard Business Review, 69 (3), 1991, 130-135.

- Horngren, T. C., Sundem, G. L., Stratton, W. O., Burgstrahler, D., Schatzberg, J. Introduction to Management Accounting (15<sup>th</sup> edition), Pearson, New Jersey, NJ, 2011.
- Jakobsen, M., & Lueg, R., "Balanced Scorecard and controllability at the level of middle managers – The case of unintended breaches ", Journal of Accounting and Organizational Change 10 (4), 2014, 516-539.
- Kaplan, R. S., & Anderson, S. R., Time-Driven Activity-Based Costing: A Simpler and More Powerful Path to Higher Profits, Harvard Business School Press, Boston, MA, 2007.
- Malmrose, M., & Lueg, R., "Costing allocation and different implications in a small clothing manufacturing company – A case study", European Journal of Management 14 (2), 2014, 51-62.
- Malmrose, M., Lueg, R., Khusainova, S., Iversen, P. S., & Panti, S. B., "Charging customers or making profit? Business model change in the software industry", Journal of Business Models, 2(1), 2014, 19-32.
- Lueg, R., "Customer accounting with budgets and activity-based costing: a case study in retail banking" Journal of Academy of Business and Economics, 15(2), 2015, 41-48.
- Lueg, R., "Product customization: A case study on choosing the right costing system", International Journal of Business Strategy, 15(2), 2015, 63-68.
- Lueg, K., Lueg, R., & Lauridsen, O., "Aligning seminars with Bologna requirements: Reciprocal peer tutoring, the SOLO taxonomy and deep learning", Studies in Higher Education, 41(9), 2016, 674–1691.
- Lueg, R., "Führt der Einsatz externer Berater zur Überimplementierung innovativer Steuerungsinstrumente?", Zeitschrift der Unternehmensberatung 4 (6), 2009, 249-253.
- Lueg, R., & Lueg, K., "The Balanced Scorecard and different Business Models in the textile industry - A case study", International Journal of Strategic Management, 13 (2), 2013, 61-66.
- Lueg, R., & Lueg, K., "From teacher-centred instruction to peer tutoring in the heterogeneous international classroom: a Danish case of instructional change", Journal of Social Science Education 14 (2), 2014, 39-62.
- Lueg, R., & Malmrose, M., "Customer accounting with budgets and activity-based costing: a case study in electronic commerce", International Journal of Strategic Management 14 (2), 2014, 25-36.
- Lueg, R., & Morratz, H., "Understanding the error-structure of Time-driven Activity-based Costing: A pilot implementation at a European manufacturing company", European Journal of Management, 17(1), 2017, 49-56.
- Lueg, R., & Storgaard, N., "The adoption and implementation of Activity-based Costing: A systematic literature review", International Journal of Strategic Management, 17(2), 2017, 7-24.