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ANALYSIS OF RESPONSIBILITY CENTERS PERFORMANCE IN BUSINESSES BY SYSTEM DYNAMICS METHOD*

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ABSTRACT

Today, the high dynamism of the business sector makes it difficult for managers to make decisions about the future of their businesses. Business managers need to keep their businesses and all units of them under control in all aspects in order to make effective decisions. In order to achieve this, responsibility centers and the data produced in these centers are used. Today, analyzing the data produced in the responsibility centers dynamically has become a necessity. System dynamics models that enable dynamic analysis of business data have been used successfully in recent years. System dynamics approach, which is also used in different business sectors, is a simulation method that can be used in solving dynamic problems and developing business strategies that traditional management accounting techniques have difficulty in responding. In this study, a model of a manufacturing enterprise has been created to measure the performance of responsibility centers within the enterprise. The data obtained from this model is evaluated with the help of the model and the future performance of the enterprise is tried to be predicted. Using this model, different scenarios were tried out and the results were compared, and it was revealed that the system dynamics could be used effectively in the evaluation of responsibility centers and business performance.

Keywords: Management Accounting, System Dynamics, Responsibility Center, Business Performance.

JEL Codes: M41, C53.

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İŞLETMELERDE SORUMLULUK MERKEZLERİ PERFORMANSININ SİSTEM DİNAMİĞİ YÖNTEMİYLE ANALİZİ

ÖZ

Günümüzde işletmecilik sektörünün çok yüksek bir dinamizme sahip olması işletme yöneticilerinin işletmelerinin geleceği ile ilgili karar almalarını zorlaştırmaktadır. İşletme yöneticilerinin günümüzde etkili karar alabilmeleri için işletmelerini tüm yönleriyle ve tüm birimleriyle kontrol altında tutmaları gerekmektedir. İşletmelerin kontrol altında tutulabilmesi için sorumluluk merkezlerinden ve bu merkezlerde üretilen verilerden faydalanılmaktadır. Günümüzde, sorumluluk merkezlerinde üretilen verilerin dinamik bir şekilde analiz edilmesi bir zorunluluk halini almıştır. İşletme verilerinin dinamik bir şekilde analizini mümkün kılan sistem dinamiği modelleri son yıllarda başarılı bir şekilde kullanılmaktadır. İşletmecilik sektöründe de kullanılan sistem dinamiği, geleneksel yönetim muhasebesi tekniklerinin cevap vermekte zorlandığı sorunlara, problemlerin dinamik bir şekilde çözülmesinde ve işletme stratejilerinin geliştirilmesinde kullanılabilen bir simülasyon yöntemidir. Çalışmada, işletme bünyesindeki sorumluluk merkezlerinin performanslarının ölçülmesinde bir üretim işletmesinin modeli oluşturulmuştur. Bu modelden elde edilen veriler model yardımıyla değerlendirilerek işletmenin gelecek dönemlerdeki performansı öngörülmeye çalışılmıştır. Oluşturulan bu model üzerinden farklı senaryolar denenmiş ve sonuçlar karşılaştırılarak sorumluluk merkezleri ve işletme performansının değerlendirilmesinde sistem dinamiğinin etkili şekilde kullanılabileceği ortaya konulmuştur.

Anahtar Sözcükler: Yönetim Muhasebesi, Sistem Dinamiği, Sorumluluk Merkezi, İşletme Performansı.

JEL Kodları: M41, C53.

1. INTRODUCTION

The world is changing and developing constantly. This change and development process goes on increasing its speed day by day. Almost all areas, especially business administration, have been affected by this dynamic process. In such a rapidly changing environment, businesses should accurately identify human demands and needs and offer their goods and services at the desired quality, place, and time. One of the most important features that businesses need in order to fulfill these requirements is the ability to survive by gaining the skill to change and grow in keeping with the times. In today's dynamic environment, the growth, change and continuity of a business depends on the successful management of it, and thus on its total performance. While business performance is an evaluation measure of the efficiency and productivity of business activities, the total performance is expressed as the total performance of people working at all levels of the business and of responsibility centers (Özkan, 2013: 156).

With the increase of businesses on a global scale, the conditions of competition have become more difficult. Being able to respond to changing demands under these conditions reveals the need for business information systems to produce more detailed, technical, and timely information.

Collecting, recording, classifying analysing of the data required by businesses in such a manner that it enhances business' control over the resources is performed by responsibility centers (Drobyazko, Shapovalova, Bielova, Nazarenko, and Yunatskyi, 2019: 1). For this reason, responsibility centers have an important effect in providing the information needed by the management and increasing the total performance of the enterprise.

Indicators that reveal the extent to which each department within the organizational structure of the enterprise fulfills its responsibilities are periodically presented in a report. These organizational units, which are accepted as a separate accounting and reporting units in management accounting, are called responsibility centers. The responsibility accounting includes the responsibility reports that reveal the periodic operation results of the responsibility centers, and all management accounting practices aiming to prepare these reports (Büyükmirza, 2017: 40-41). Owino (2017) defines responsibility accounting as an accounting method that collects and presents information about the cost and / or income of each position of responsibility in an organization in periodic reports in order to ensure the planning and control activities related to the business performance of business managers. Similarly, Zimmerman (2011) states that the responsibility accounting system is a part of the performance measuring system used to assess the activity results of a responsibility center.

Responsibility centers consist of units or sub-units within an enterprise. According to the literature, there are four types of responsibility centers. These can be listed as (1) cost, (2) income, (3) profit, and (4) investment center (Mahmud, Anitsal, and Anitsal, 2018: 87). One of the most important centers of responsibility are cost centers. The head of cost center usually aims at achieving operational efficiency, minimizing product costs, and working effectively without a reduction in quality. The income center is the center of responsibility where maximum income is tried to be obtained through marketing, sales, and after-sales activities. Income center performance is measured by comparing actual income with estimated or budgeted income amounts. Especially the theoretical complexity in the legal, tax, and partnership structures of international businesses made it difficult to determine the operating profit of each business. This has led to the creation of a profit center as a separate responsibility center in large enterprises. Investment centers are centers with budget performance focused on return on investment. In determining the investment centers, the income, costs, and net assets of the relevant center are taken into consideration. Every investment center requires new investment tools in order to sustain its activities effectively and efficiently. Therefore, the investment center manager is responsible for the costs, incomes, assets, and liabilities of the relevant center. (Karadeniz, 1997: 39-43).

With respect to the data above, it is clear that all responsibility centers are interrelated. In order to increase the total performance of the enterprise, responsibility centers should work smoothly and be in touch with each other, in line with the same goal. Changes in the internal and external environments of businesses have increased the role of responsibility centers in decision-making of business managers. Today, traditional management accounting techniques are insufficient to provide the information managers need for decision making and control processes. Therefore, traditional methods in management accounting have to be replaced with new methods that are detailed, interrelated, based on causal connections and systematic (Aksu, Söyler, and Eren, 2014: 72).

Today, the effort to replace traditional models with new methods in management accounting keeps going as it is the case in all areas of business. In this new era, which has a high dynamism, "System Dynamics" establishing effective coordination among the responsibility centers is regarded as one of the methods, by which business managers can make evaluations about all internal and external elements of the company and increase the overall performance. As a matter of fact system dynamics have been successfully applied in many fields such as engineering, environment, education, and economy for more than 50 years.

The system dynamics approach allows managers to perceive different scenarios in the decision-making process by effectively presenting the relationships between system variables with the help of "causal loop" and "stock-flow" diagrams. Discovering the behavior patterns of variables with different scenarios contributes to the strategic decision-making processes of managers regarding the business (Aksu, 2013b: 29).

When system dynamics is applied to businesses in the early 1960s, it has been observed that it can have a significant impact on the decision and control processes of businesses. In addition, it is defined as a management discipline that deals with system dynamics, the dynamics and control of managed systems used in areas such as urbanism, engineering, economy, and environment (Coyle, 1996: 1-3). System dynamics, rather than being a prediction tool, aims to develop appropriate policies by analyzing the behavior of the system (Söyler, 2006: 1). Therefore, it is regarded as that it can be used successfully in the analysis of the structure of responsibility centers in enterprises and can be an important data source for increasing the total performance of the enterprise.

In this study, the "system dynamics" approach, which is a dynamic simulation method, was used to analyze the performance of responsibility centers of enterprises effectively. The performances of the responsibility centers also represent the total operating performance. System dynamics is a method by which the relationships and feedback among the elements of the

system can be shown. By the method, an exemple system dynamics model of responsibility centers was created, and the trends of variables for different scenarios were observed to assist business managers in control and decision-making processes. Then, the model outputs were analyzed by running the model under different scenarios.

2. LITERATURE REVIEW

In this section, a literature review has been made on the responsibility centers used to measure the performance of the relevant unit within the business and system dynamics studies in the field of business administration.

Mojgan (2012) examines the role of responsibility accounting on organizational structure in his study. In the study, it was emphasized that transferring daily activities to mid-level managers and focusing on strategic decisions would be more effective for business performance. Moreover it was stated that responsibility accounting was a method that could create the entire planning of production, marketing, management, and finance departments within an organization by using planning and control functions. Finally it was stated that it would be useful to use responsibility accounting in the business organization since it gives more importance on the evaluation of activities rather than production costing.

Magablih (2017) states in his study that the performance measurement system is affected by the decisions taken in the responsibility centers and measures the performance of the responsibility centers. The author also states that the failure of the managers responsible for the responsibility centers to achieve the determined budget targets does not mean that they would be punished. He also states that the responsibility center manager has to understand the causes of negativity with the center and take responsibility to correct them.

Biswas (2017), in his study examining the literature on responsibility accounting, states that responsibility centers has an important role in finding a causal relationship between activities and performance of activities and in evaluating divided performances. By responsibility accounting, which was mostly used in large enterprises, businesses provided effective cost control by coordinating different activity units. The author expresses that the use of responsibility accounting in businesses contributed to the adoption of accountability and strengthening of controllability for the business manager.

Çanakçıoğlu (2019) deals the responsibility centers and functions that should be included in the organizational structures of companies operating in the logistics sector. It was stated that the companies in Turkey put up resistance to institutionalization and the companies didn't establish

management accounting information subsystems. It is concluded that the employees were reluctant to prepare responsibility reports and they did not believe that performance evaluation would be made according to these reports.

Festus, Ochai-Adejoh, and Ayodeji (2020) examines the effect of responsibility accounting on the profitability of companies listed on the Nigerian Stock Exchange. The authors concluded that responsibility accounting, which controls the firm size, significantly affects the profitability of companies listed on the Nigerian stock exchange.

In the literature review on the subject, it has been determined that there are system dynamics models that will help business management to make effective decisions. However, we couldn't have determined any study on modeling the responsibility centers by using the system dynamics within the framework of responsibility accounting. The literature review on system dynamics studies used in the business field is as follows.

Yamaguchi (2003) states that system dynamics would contribute positively to better management of companies and a better understanding of financial statements by business managers. In the study, it is explained that the accounting information system is an area suitable for system dynamics principles by modeling the balance sheet, income statement, and cash flow statement, which are the basic elements of the accounting system, according to the system dynamics approach.

Melse (2006) reveals the principles of the financial accounting model in his study. In the study, a system dynamics model was developed by using the properties of the accounting equation. In the model, the accounting equation was expressed as a dynamic stock-flow model that describes both dimensions of the double-entry system. He asserted that dynamic business models that can meet the requirements of both financial and management accounting can be put forward with the system dynamics method.

Qureshi (2007) investigated the effect of financing and dividend distribution policies on firm value through a firm model based on system dynamics. In the study, it has been understood that a low debt structure plays an important role in maximizing firm value. In addition, it was emphasized that consistent and balanced dividend policies have an important effect on maximizing the value of the firm.

Aksu (2013a) created a cash budget model using the system dynamics and analyzed the behaviour of the model under different scenarios. In the study, it was stated that the model offers businesses the opportunity to see their cash status at any time and gives information about the amount and duration of their cash need if any. In addition, it was stated that the cash budget

model created can be used in many accounting issues that management needs, from calculating production costs to cost volume profit analysis.

In their study Giorgino, Barnabè, and Kunc (2017) reveals that qualitative data in management accounting and corporate reporting can be analyzed with system dynamics by using the existing data of enterprises. They explored that the qualitative information in the integrated reports of the enterprises is effective in understanding the dynamic complexity of the enterprises, with resource mapping and system dynamics. It is also stated in the study that system dynamics and resource mapping can be a new approach in order to overcome the complexity of qualitative and quantitative information in the accounting field.

Pierson (2020) creats an accounting model with a system dynamics approach in order to better analyze the accounting reports used by academicians and practitioners in their projects. In the study, it was stated that modeling the accounting reporting process with system dynamics creates a more reliable accounting structure and that such accounting structures will also facilitate projects.

3. STRUCTURE OF THE MODEL

System Dynamics is an approach that combines theory, method, and philosophy to understand complex systems. System dynamics is a tool used especially from feedback control to policy analysis and decision-making processes, analyzing their effects on system behavior. The modeling process in system dynamics can be summarized in the following basic steps (Guerra, Murino, & Romano, 2014, p.172):

1. Identifying and defining the system to be analyzed,
2. Dynamic formulation of system tools to explain the causal relationships between system variables,
3. Development and implementation of the simulation model,
4. Alternative policy analysis and model deepening/review,
5. Discussion of results and implementation planning,
6. Review of business structure and policies.

It should be noted that these steps can be changed appropriately and it is possible to return back to the previous step for a better understanding of the system.

In the study, taking into account the above modeling steps, the responsibility centers of the MLT manufacturing enterprise are modeled. Information about the responsibility centers of the enterprise is as follows. MLT

manufacturing company has decided to establish responsibility centers within the company in order to evaluate the performance of the company and to make effective strategic decisions regarding the production process. The company wants to measure its business performance with three responsibility centers: cost center, income center, and investment center. In addition, it plans to reflect customer satisfaction regarding the product produced to the business performance through its responsibility centers. In line with the plan prepared within this scope, data on the functioning of the responsibility centers is given below.

Cost Center: The cost amount, which is budgeted using standard costs for each period in the cost center, is compared with the cost amount realized during the period. 20 percent of the positive cost deviation amount that occurs during the period is paid as an incentive to the employees working in the cost center. It is anticipated that a positive cost deviation (reduction in costs) about 5 times the incentives paid to the employees in current month will be obtained due to their performance in the next month. If the cost deviation is negative there is nothing to do. In addition, customer complaints and satisfaction are measured in every period, from the production quality of the product produced to the sales and after-sales services. If customer satisfaction is positive, additional incentive amount as much as the customer satisfaction rate is paid to the employees working in the relevant center. Customer satisfaction and complaints about the product are reflected in the cost center if they are related to the quality of the product, and to the income center if they are related to the sale of the product and after-sales services. The customer satisfaction rate is determined by customer who declares him/herself as satisfied costumer that occurs in the period by the total number of products sold. Similarly, the number of complaints about the products sold in the period is divided by the number of products sold, and the customer complaint rate is determined. Afterward, the positive customer satisfaction rate is determined by subtracting the customer complaint rate from the customer satisfaction rate, and additional incentives are paid to the employees as much as the amount calculated by multiplying this rate with the incentive amount given to the personnel. The enterprise had predicted a budgeted cost of 100,000 ₺, by considering the circumstances - the quantity of products to be produced, capacity, standard costs etc.- for January. As a result of the market analysis, it is anticipated that a positive cost deviation of up to 20 percent of the budgeted cost amount may be possible. The cost amount realized in this period is 95,000 ₺. The customer satisfaction rate measured in January is 0.60, 40 percent of this ratio is related to the cost center and 60 percent is related to the income center. The rate of complaints about the product sold in the period is 0.30, 60 percent of this rate is related to the income center. Personnel incentive policy is applied in all responsibility centers of the enterprise.

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Income Center: The company has budgeted 150,000 ₺ income from sales considering the circumstances such as competitors, market share, selling price. It is anticipated that positive budget deviation can realize at the maximum rate of 20 percent. An income of 160,000 ₺ was obtained during the period. It was observed that a positive income deviation is obtained, due to personnel performance in the next month, 4 times the incentives had paid to personnel working in the income center.

Investment Center: The amount of income expected by the enterprise from the investment made in production is determined separately for each period, by taking into account the situations such as opportunity cost, economic life cycle, sustainability of the investment, and additional costs of the investment. Then the amount is reflected the cost center and the income center. The amount up to 5 percent of the positive deviation in the investment center is paid as an incentive to the staff working in this department.

Considering the information about the responsibility centers of the business, the business performance model is shown in Figure 1, and the mathematical equations of the model are shown in Table 1.

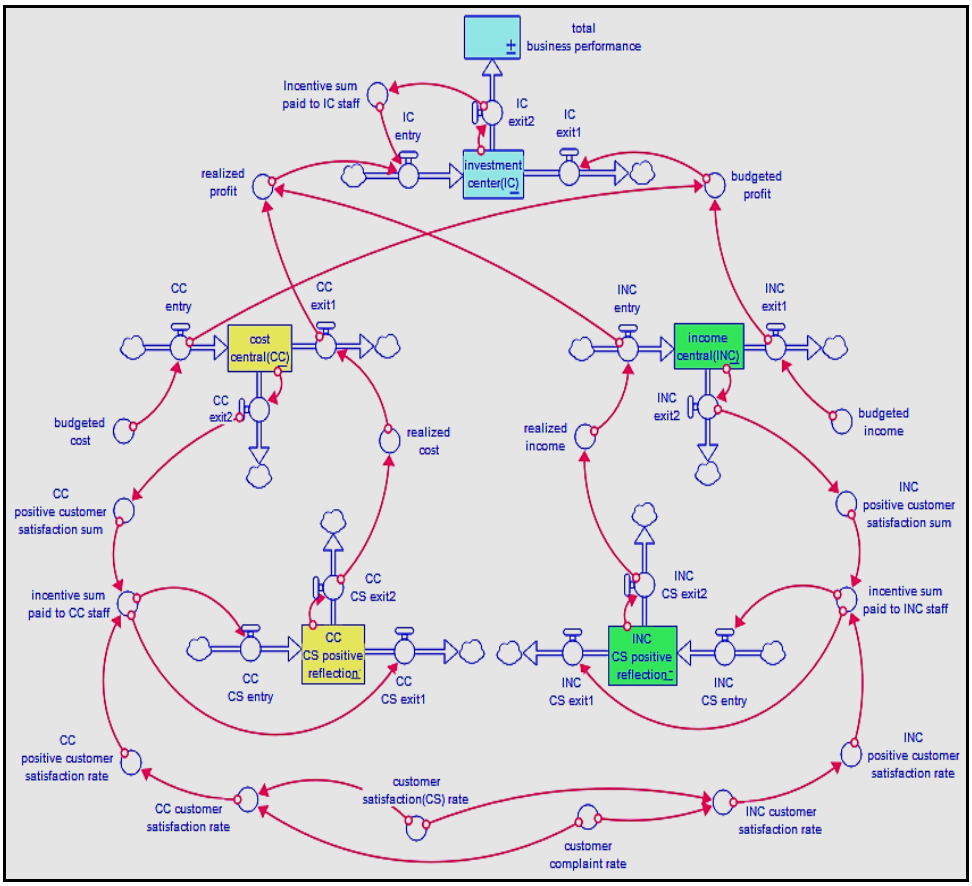

Figure 1: Responsibility Centers Performance Measurement Model

Table 1: Mathematical Equations of the Model

Model Elements		Mathematical Equations
	CC_CS_positive_reflection(t)	CC_CS_positive_reflection(t - dt) + (CC_CS_entry - CC_CS_exit1 - CC_CS_exit2) * dt
	cost_central(CC)(t)	cost_central(CC)(t - dt) + (CC_entry - CC_exit1 - CC_exit2) * dt
	INC_CS_positive_reflection(t)	INC_CS_positive_reflection(t - dt) + (INC_CS_entry - INC_CS_exit2 - INC_CS_exit1) * dt
	income_central(INC)(t)	income_central(INC)(t - dt) + (INC_entry - INC_exit2 - INC_exit1) * dt
	investment_center(IC)(t)	investment_center(IC)(t - dt) + (IC_entry - IC_exit1 - IC_exit2) * dt
	total_business_performance(t)	total_business_performance(t - dt) + (IC_exit2) * dt
	CC_CS_entry	incentive_sum_paid_to_CC_staff*5
	CC_CS_exit1	incentive_sum_paid_to_CC_staff
	CC_CS_exit2	CC_CS_positive_reflection
	CC_entry	budgeted_cost
	CC_exit1	MAX(realized_cost;80000)
	CC_exit2	cost_central(CC)
	IC_entry	realized_profit+Incentive_sum paid_to_IC_staff
	IC_exit1	budgeted_profit
	IC_exit2	investment_center(IC)
	INC_CS_entry	incentive_sum_paid_to_INC_staff*4
	INC_CS_exit1	incentive_sum_paid_to_INC_staff
	INC_CS_exit2	INC_CS_positive_reflection
	INC_entry	MIN(realized_income; 180000)
	INC_exit1	budgeted_income
	INC_exit2	income_central(INC)
	budgeted_cost	100000
	budgeted_income	150000
	budgeted_profit	INC_exit1-CC_entry
	CC_customer_satisfaction_rate	(customer_satisfaction(CS)_rate*0,40)-(customer_complaint_rate*0,60)
	Incentive_sum_paid_to_CC_staff	(CC_positive_customer_satisfaction_sum*0,20)+((CC_positive_customer_satisfaction_sum*0,20)*CC_positive_customer_satisfaction_rate)
	CC_positive_customer_satisfaction_rate	IF CC_customer_satisfaction_rate<0 THEN 0 ELSE CC_customer_satisfaction_rate
	CC_positive_customer_satisfaction_sum	IF CC_exit2<0 THEN 0 ELSE CC_exit2
	customer_complaint_rate	0,30
	customer_satisfaction(CS)_rate	0,60
	INC_customer_satisfaction_rate	(customer_satisfaction(CS)_rate*0,60)-(customer_complaint_rate*0,40)
	Incentive_sum_paid_to_INC_staff	(INC_positive_customer_satisfaction_sum*0,20)+((INC_positive_customer_satisfaction_sum*0,20)*INC_positive_customer_satisfaction_rate)
	INC_positive_customer_satisfaction_rate	IF INC_customer_satisfaction_rate<0 THEN 0 ELSE INC_customer_satisfaction_rate
	INC_positive_customer_satisfaction_sum	IF INC_exit2<0 THEN 0 ELSE INC_exit2
	Incentive_sum paid_to_IC_staff	IC exit2*0,05
	realized_cost	95000-CC_CS_exit2
	realized_income	160000+INC_CS_exit2
	realized_profit	INC entry-CC exit1

After the model had created and run, the outputs were analyzed.

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4. ANALYSIS OF DATA AND INTERPRETATION

The management wants to see a 12-month performance situation in order to make true and effective decisions. Accordingly, the following analyzes have been made.

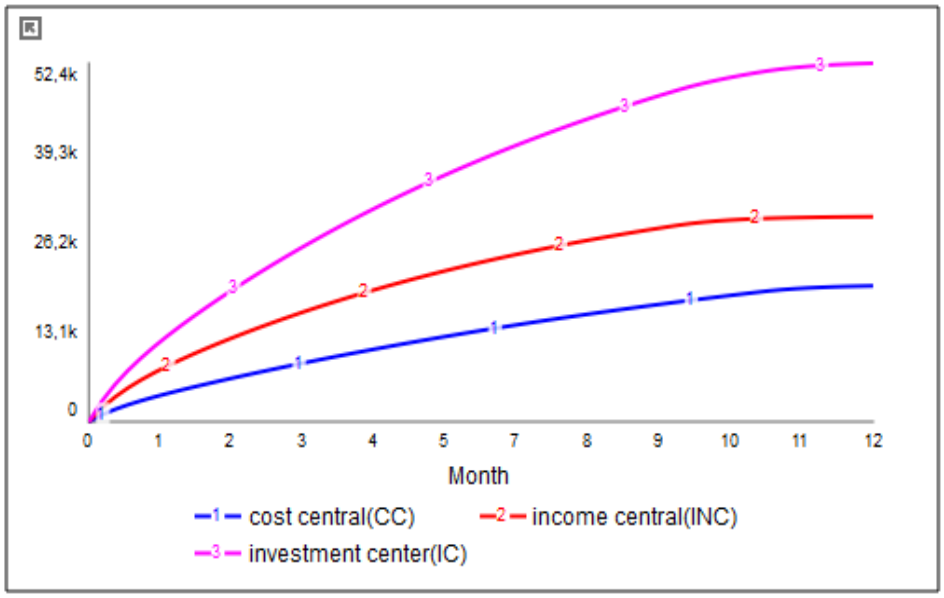

Figure 2: Performances of Responsibility Centers

The monthly performances of the responsibility centers obtained through the system dynamics model for the next 12 months based on the January data regarding the responsibility centers of the enterprise are shown in the graphic in Figure 2. When the performance levels of the cost center are examined, it is observed that the performance values of this center had an upward trend until the 10th month and reached the maximum performance level in the 10th month. Similarly, it is seen that the performance of the income center has reached its maximum performance value (30,000 ₺) in 9.4 months. It was determined that the investment center (since MLT enterprise has only one investment center, the investment center also reflects the operating performance) reached the maximum performance level (52,600 ₺) in 10.2 months.

Based on the assumption that January data are repeated throughout the year (for 12 months) in the responsibility centers of the MLT enterprise, the information about the incentives paid to the personnel at the end of the 12 months is shown in figure 3.

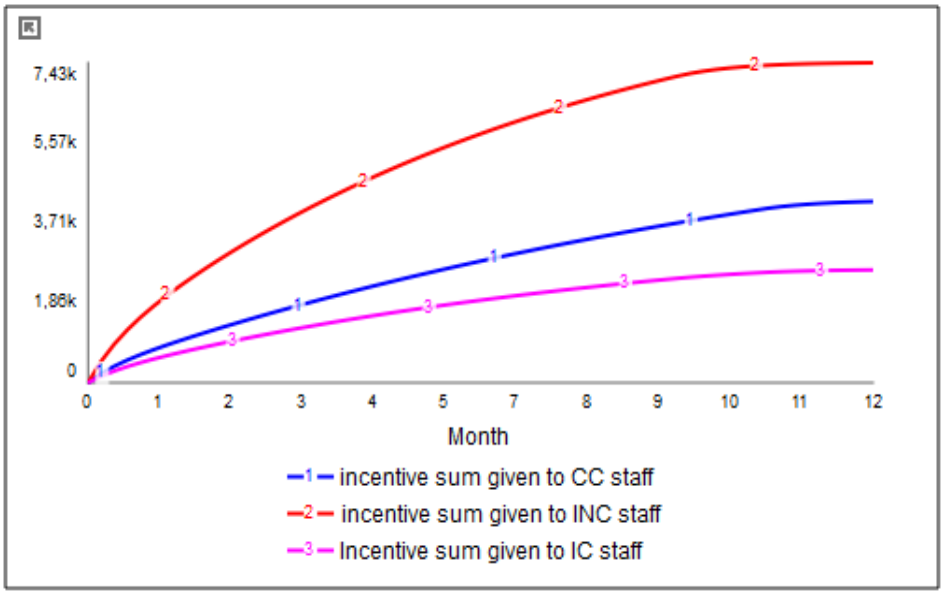

Figure 3: Incentives Paid to Personnel

According to the data in Figure 3, it is seen that the amount of incentives paid to the personnel working in the all three responsibility centers gradually increases, and the highest incentive amounts are paid in the 12th month in these centers. In the 12th month, it is seen that the incentive payment will be 4,210 ₺ to the personnel working in the cost center (cc), 7,430 ₺ to the personnel in the income center (inc), and 2,620 ₺ to the personnel in the investment center (ic).

In order to make comparative analyzes, MLT managers aim to make some improvements for customer satisfaction. Business management wants to compare the current business performance with the business performance that will occur after improvements. Table 2 shows the current status of the enterprise and the targeted status (post improvements) data.

Table 2: Current and Target Status Data of Responsibility Centers

System Components	Current Condition	Targeted Condition
Customer Satisfaction	0.60	0.90
Customer Complaints	0.30	0.15

Information about the net realized cost from the new business performance, which is formed by adding the data in Table 2 to the model, is shown in the graphic in Figure 4.

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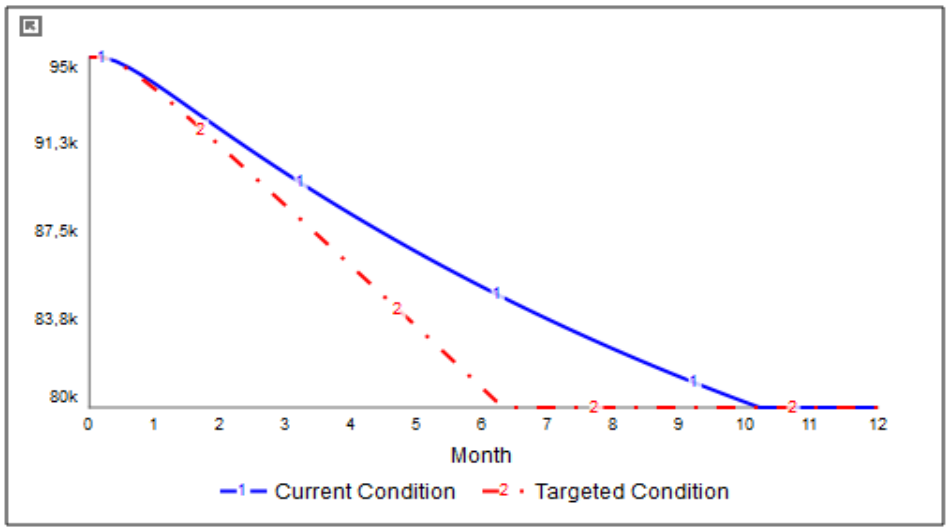

Figure 4: Net Actual Cost Based on Current Condition and Targeted Condition

Net actual cost amount is calculated by adding the amount paid to the personnel and the positive reflection of this amount to the cost amount realized in the relevant period.

According to Figure 4, while the net actual cost amount in the cost center reaches 80,000 ₺, which is the minimum cost level determined by the business management in 10.2 months, in the targeted case, this level is reached in 6.2 months. Thus, the business management can see the difference between situations and reach a judgment about which elements of the system are effective to increase the performance of the responsibility center.

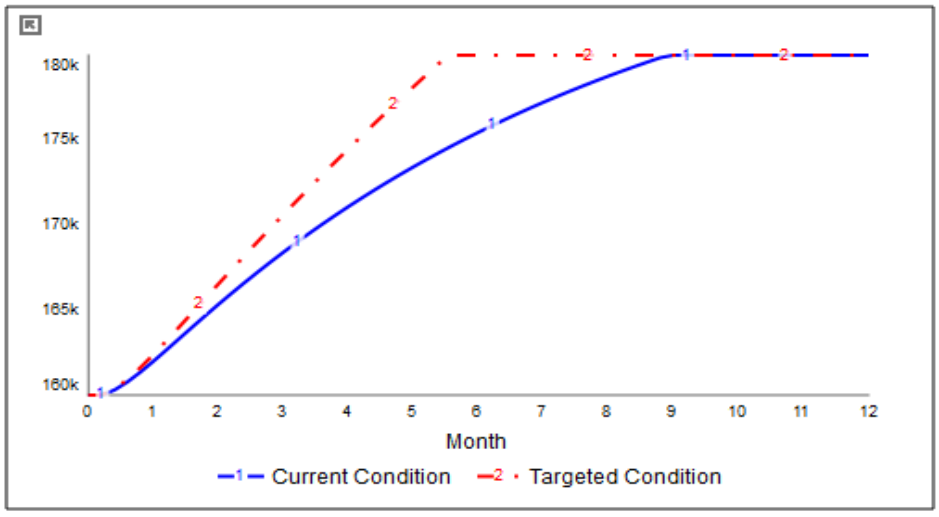

Figure 5: Net Realized Income Based on Current and Targeted Condition

Net actual income amount is calculated by adding the amount paid to the personnel and the positive reflection of this amount to the income amount realized in the relevant period. According to Figure 5, while the net actual income amount in the income center reaches the maximum income level (180,000 ₺) determined by the business management in 8.6 months, in the targeted situation this level is reached in 5.4 months.

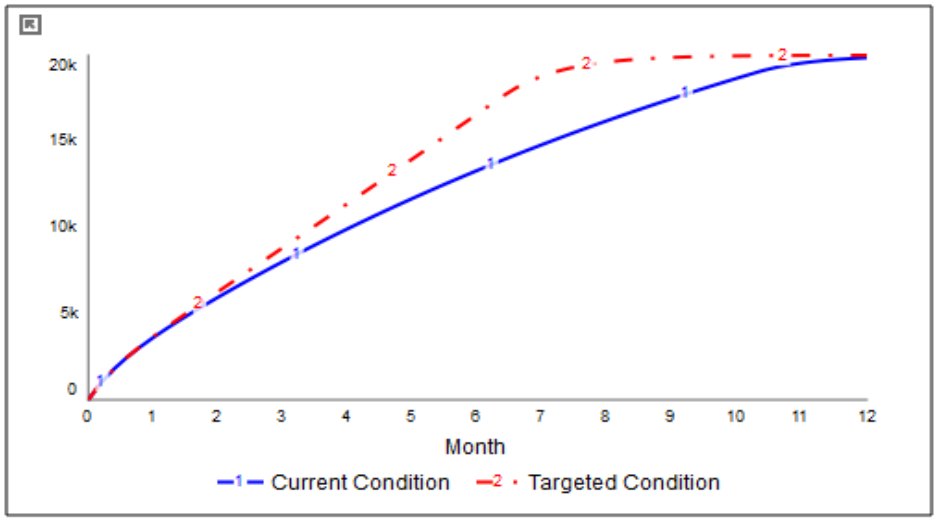

Figure 6: Cost Center Performance Based on Current and Target Condition

Figure 6 compares the current cost center performance with the targeted cost center performance. Accordingly, while the cost center performance currently reaches the level determined by management in the 12th month, it is seen that it may reach this level in 10 months in the targeted condition.

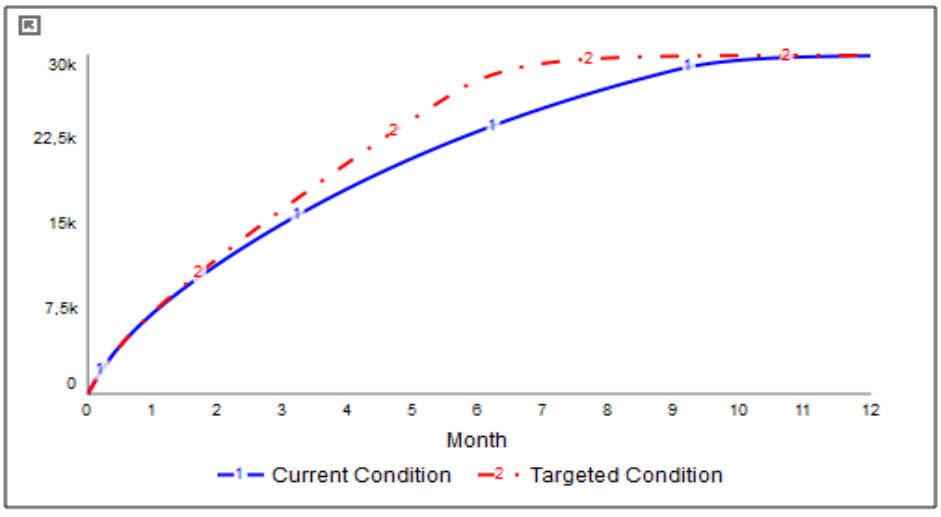

Figure 7: Income Center Performance Based on Current and Target Condition

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Figure 7 compares the current income center performance with the targeted income center performance. Accordingly, while the income center performance in the current situation reaches the level determined by management in the 11th month, it is seen that it may reach this level in 8 months in the targeted condition.

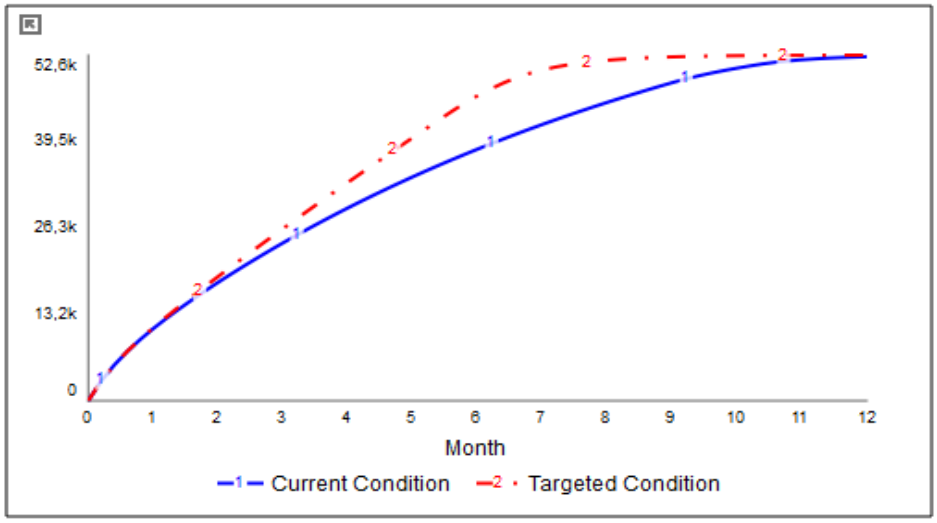

Figure 8: Investment Center Performance Based on the Current and Target Condition (Total Business Performance)

Figure 8 compares the current investment center performance with the targeted investment center performance. Since there is only one investment center in the MLT business, the investment center performance also reflects the total operating performance. According to Figure 8, while the investment center performance reaches 52,600 ₺, which is the highest performance level of the center at the end of the 12th month, in the targeted condition it may reach this level in 10 months.

5. CONCLUSION

Today, rapid change and development continue in the field of business administration as in every field. In this dynamic process, businesses need to keep their cost, income, profit and investment centers under control in order to survive. It has become a necessity for the business management to use dynamic analysis that allows almost daily analysis as well as keeping the business under control with its responsibility centers. Business management uses responsibility centers to keep their businesses under control. However, today, the data flow should be formed and analyzed dynamically in the responsibility centers. In addition, it is important for the business management to predict the level of business performance in the future with the current data produced in the responsibility centers. Thus, necessary

interventions to the relevant responsibility center of the enterprise can be made on time and it will be easier to make strategic decisions for the enterprise. It is known that the use of system dynamics in the field of business administration has many benefits for business management. One of these benefits is that with the help of system dynamics models, the impact of the decisions to be taken by the business management can be presented immediately. When compared to some other methods, considering almost all variables that may affect business activities system dynamics models, which gives results very close to the real situation.

In the study, a basic model was created in order to indicate that the performance of the responsibility centers and the enterprise as a whole can be dynamically monitored with the system dynamics model of responsibility centers in management accounting. In addition to dynamically monitoring the responsibility centers and business performance with the created model, the situation that may be encountered in the future is simulated by comparing the current data with the targeted data. It has been observed that by the help of this method a dynamic data set can be achieved, that the business management can keep the business under control with all its elements and make strategic decisions on time.

This is the first study in which system dynamics modeling is used to measure the responsibility centers of the enterprises in the literature and therefore the total performance of the enterprise. Therefore, the responsibility center model, which was created simply in the study, can be easily applied by expanding it in accordance with larger and more complex business structures.

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