Administrative Court of Appeals Backlog Dynamics

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Abstract: This paper focuses on the dynamics of the backlog of the Administrative Court of Appeals of Tirana, Albania. The Administrative Court of Appeals, being one of its kind, since it was established (end of 2013), has been incapable to maintain an acceptable backlog of cases. To portray the behavior over time of this problem a system dynamics approach was applied. The preliminary model replicates the behavior of the backlog from the first quarter of 2014 to the third quarter of 2016 and makes forecasts until the end of 2021. The paper, by exploring past and present conditions through a simplified model, finds that the issue will continue to exist if conditions remain the same. To tackle the problem, a short-term and a long-term policy are tested as possible solutions which can be applied through managerial intervention.

Keywords: *System dynamics, Judicial service, Backlog, Court, Work pressure*

1. Introduction

Service is broadly considered as an application of specialized knowledge, skill, and experience, performed for co-creation of respective values of both consumer and provider (Lusch and Vargo, 2006; Spohrer et al, 2007). Service operations have unique characteristics and involve the collaboration of several actors. Therefore, they can be considered as supply chain processes that are balanced around the capacity of the firm through the upstream sourcing processes (Giannakis, M. 2011). A supply chain has various forms. The overall supply chain includes supplier, manufacturer, distributors and retailer. In fact, like the production supply chain of goods, services supply involves the collaboration of the service providers, the suppliers of other services or resources needed for the design and delivery of these services and the service clients, all working together to co-produce value in complex value chains or networks (Sakhuja and Jain. 2012). Hence, a supply chain can be defined as follows: an integration of a series of entities (individual person, organization, enterprise) to provide personalized service directly or indirectly (Wu and Yang. 2009). Taking to account this definition, the term supply chain can be applied also to the justice system. Hence the justice system can be seen as a service supply chain, and judicial cases flow through these chains, as they are examined by the judicial personnel (López and Zúñiga, 2013). The justice system is not, however, a simple supply chain. It stands at the core of any democratic system

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because its mission is to guarantee a reasonable coexistence in society (López and Zúñiga, 2013). Its importance cannot be underestimated. In these supply chains users have the right to receive and justice providers have the responsibility to provide high levels of quality, efficiency, and transparency (López and Zúñiga, 2013).

System Dynamics has been broadly used to analyze supply chain management. The application of System Dynamics Modelling to Supply Chain Management has its roots in Industrial Dynamics (Forrester, 1958, 1961). The System Dynamics approach is based on internal interaction, information feedback, and cause and effect. Forrester (1961) explains industrial dynamics as follow: "*Industrial dynamics is the investigation of the information-feedback character of industrial activity to show how organizational structure, amplification (in policies), and time delays (in decision and actions) interact to influence the success of the enterprise systems*". According to Senge (1990) many factors that influence the success of an organization are rarely all visible. From a systemic perspective, an organization is a group of interrelated actions that are bound by invisible fabric and which often take years to fully play out their effect on each other. Therefore, the impacts can be seen in the short term and some will be seen in the long term due to their delays.

In general, the problem with court management and justice providers particularly, is dealing with the time required to fulfill the service and the quality change, which are inter-related actions. The discussion regarding quality change is limited to conceptual problems that make the identification of such change difficult (Sherwood, 1994). In the justice system, quality is not only limited to the adjudication of cases but is also brought in relation to the notion of independence of the judiciary. The discussion regarding the time required to provide a service is closely linked to the intangible nature of services which makes it difficult to set an optimal time, especially in the justice system, without compromising the quality of the service. For instance, the nature of judicial cases received by courts differ from each other as does the workload. Most importantly cases are adjudicated by human beings who dictate the service pace. Thus, the process is affected by behavioral issues. Sterman (2000) states that: "*We cannot put managers up on the lab bench and run experiments to determine their transfer function or frequency response. We believe all electrons follow the same laws of physics, but we cannot assume all people behave in the same way.*" Therefore, according to Sterman (2000), modeling human behavior differs from modeling physical systems in engineering and the sciences. Returning to the argument that the justice system can be seen as a service supply chain, it's difficult to attribute a specific problem to a certain part of the system. According to Senge (1997), being an element of a system makes it harder to have an overview on the whole system. Systems thinking and System Dynamics particularly, is a useful framework and a tool to help us look at the big picture and its changes, instead of looking for answers in smaller parts of the system. According to Richardson and Pugh (1981), the aim of using System Dynamics should focus on the system's problem, not the system by itself. Hence, in this paper we use system dynamics to address the problem of the high level of backlog in the Administrative Court of Tirana. A System Dynamics approach

will help breaking a system into pieces and examining each element of the system to find the impacts on a macro-level.

1.1. A specific case: Administrative Court of Appeal of Tirana

Disputes that arise from individual administrative acts, normative subordinate legal acts and public administrative contracts issued during the exercise of administrative activity by the public entities are adjudicated by the Administrative Courts. In Albania, there are six courts of first instance for administrative disputes and one court of appeals for administrative disputes. The territorial competences and the number of judges of these Courts are set by decree of the President of the Republic, on the proposal of the Minister of Justice through a long process. The Administrative courts have started functioning at the end of the year 2013 and since then, an immense number of cases are filed annually. The Administrative Court of Appeal, being the only one of its kind, has suffered the most from high levels of backlog. The Administrative Court, before 2016, was functioning with seven professional judges and to address the backlog problem, after 2016, six more judges were added to that court, bringing the total number to thirteen judges. In addition to the professional judges, the Court has ten assistant judges which assist in the adjudication of each case, therefore they contribute in decreasing the processing time of the cases. However, they are not eligible to judge a case on their own, therefore their contribution is considered only on the average time needed to conclude a case. By Law, the maximum number of assistant judges for each judge is two. Although the number of judges was increased by six more seats, the policy applied didn't solve the problem. Therefore, the court has more incomplete cases than completed ones.

1.2. Dynamic Problem

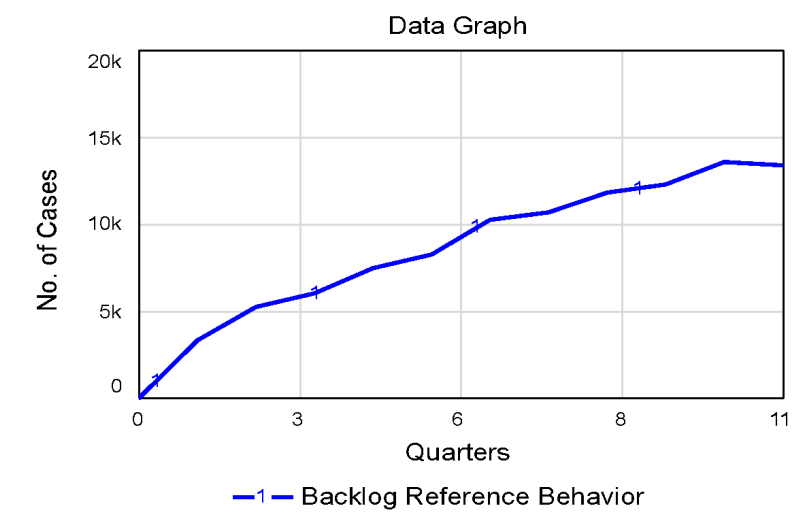

Figure 1 - Backlog development (source: High Council of Justice)

The backlog of the Administrative Court of Appeals began building up in the beginning of the 2014. Figure 1, shows quarterly data of the backlog development over a period of

almost three years, from the first quarter of 2014 to the third quarter of 2016. The horizontal axis represents quarters and the vertical axis represents number of cases. The variable backlog reference data presents the historical development of the Backlog based on the statistics collected by the High Council of Justice of Albania[2].

2. Method

System dynamics is a powerful methodology for obtaining insights into problems of dynamic complexity and policy resistance (Georgiadis & Besiou, 2008). To explore and gather insights on the problem, a simplified system dynamics model was developed that represents the issue and all the actors involved in the process (Figure 2).

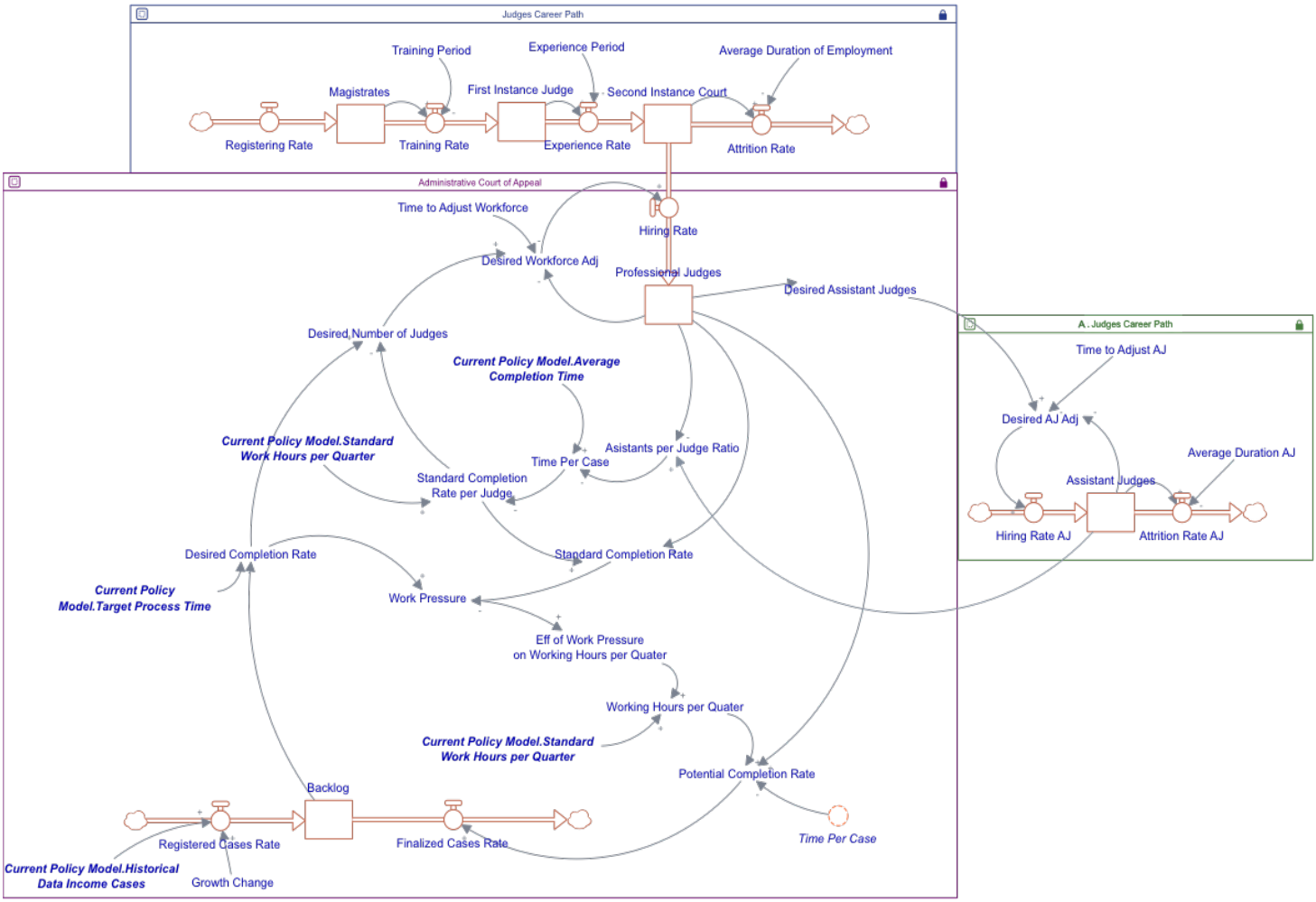

Figure 2 - SFD model

The simulation of that model provides a helpful basis for analyzing and explaining the development of key variables in the system which are responsible for the current behavior of the backlog. The model firstly was validated through a theoretical structure test where model equations were compared with the knowledge that exists in the literature, and used as a

[2] The High Council of Justice is the state authority responsible for the protection, appointment, transfer, discharge, education, moral and professional evaluation, career and oversight of the activity of judges of the courts of the first instance and the courts of appeal. (Article 1, Law no 101/2014)

starting point for the generic structure of a labor capacitated process (Sterman, 2000). Then the model was checked for dimensional consistency and calibrated to actual system parameters. Validation entailed checking for dimensional consistency to the historical behavior observed at the Court.

The Administrative Court of Appeals, before 2016, was functioning with 7 professional judges and after 2016, 6 more judges were added to that court, bringing the total number to 13 judges. In addition to the judges, the court has 10 assistant judges which assist the judges to decrease the process time of the cases, but they are not eligible to judge a case, therefore their contribution is considered only on the average time needed to conclude a case. By law it is required that the target time to deliver a case must be at the most 6 months. Historical data is used to determine the inflow. When an appeal is filed, the First Instance Administrative Courts sends the official case records to the Court of Appeals. The Court of Appeals registers the cases when they arrive, thus there is no delay in the process and hereafter the cases are considered to influence the Inflow. Therefore, the inflow is purely exogenous and we don't have control over it.

The backlog refers to an accumulation over time of the cases waiting to be finalized. Cases accumulate in a backlog until they are processed. The Finalized Cases Rate represents the number of cases completed which serves as an outflow of the Backlog. The Backlog is determined by the difference between the Registered Cases Rate and the Finalized Cases Rate. Initial backlog is zero. The Desired Completion Rate is the amount of cases the court would like to complete. The Desired Rate is determined by the backlog and the target Case time. The Target Process time represents the mandatory completion time stated by Law which is 6 months. The Standard Completion Rate represents the throughput the Court could achieve with the current number of judges working normal hours and allocating standard time to each task. The average time per task represents the judge's average time spent with a case. The average time per task was calculated based on historical data. Work Pressure measures the pressure to work above or below the standard norm and can be calculated by dividing the Desired Completion Rate with the Standard Completion Rate. Working hours per quarter represents the standard working hours influenced by the work pressure, a measure of the pressure to work at a greater or lesser rate than normal. High pressure leads to longer hours and low pressure to a reduction in hours worked.

The productivity of Judges is assumed to be the same throughout the analysis and not adjusted upward, thereby increasing the number of resolved cases, because that can influence the quality of the judicial decision making process. The Potential Completion Rate represents the rate at which tasks could be completed given the number of judges, the work hours per quarter influenced by the work pressure and the time allocated to each task. As mentioned previously, in addition to the judges, the Court has 10 assistant judges which assist the judges and decrease the processing time of cases. The ratio assistant to judge represents how many assistants are there for each judge. Based on that ratio, the time per case decreases. By law, a maximum of 2 assistant judges for a professional judge is allowed. The Finalized Case Rate is determined by the Potential Completion Rate. The negative feedback loop seeks to adjust

the state of the system as a function of the desired state but within current conditions the demand for adjudication of cases cannot be fulfilled. Figure 3 provides the results of the model if condition stay the same.

2.1. Policy application:

To tackle the problem, two policies are applied to the System Dynamics model. The first policy is a short-term policy which consists of changing the number of assistant judges based on a desired number of assistant judges (Figure 4). The desired number of assistant judges is the maximum number of assistant judges we can hire based on the current number of judges, so the number is limited. The second policy, is a long - term policy which consists in changing the number of judges based on a desired number of judges (Figure 5). This number is calculated based on the desired completion rate and the standard completion rate per judge. The application of such policies comes with additional cost for the court. In this case, if it alleviates the problem, costs are not a concern because the court doesn't have budget constraints. Therefore, if the Minister of Justice decides to add more assistant judges, or the High Council of Justice decides to add more judges then the Court is obliged to fix its budget to fulfill the decision taken by the respective institutions. The time to hire more assistant judges and its costs are lower than in the case of hiring more judges. Therefore, a mixed policy can be the best approach by hiring the maximum number of assistant judges based on the current number of judges and then hiring more judges (Figure 6).

3. Model Results

Figure 3 - Current Policy Development over time

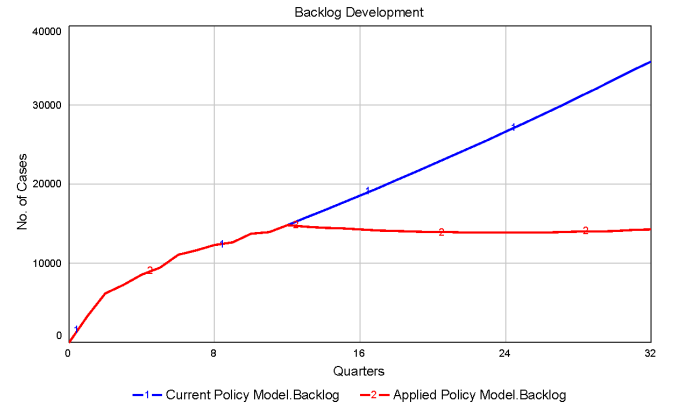

Figure 4 – Short term policy applied

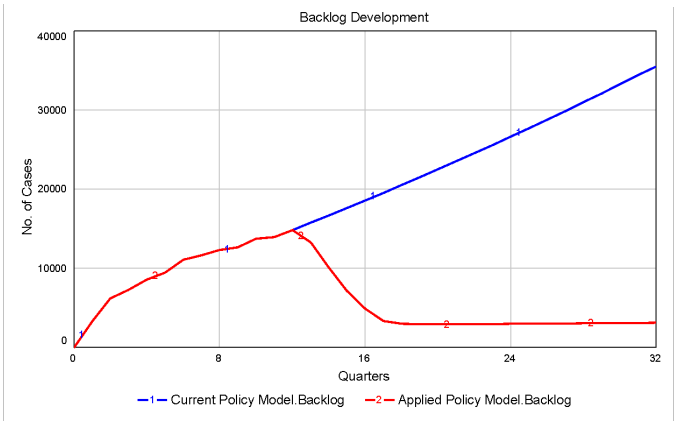

Figure 5 – Long term policy applied

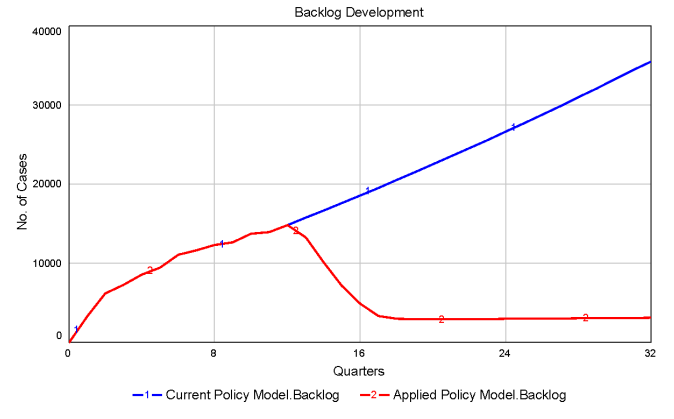

Figure 6 – Mixed policy applied

The simulations presented above show the development of the backlog in different scenarios from the first quarter of 2014 to the end of 2021. The horizontal axis represents quarters and the vertical axis represents number of cases. The policies are applied from the 12 quarter which represents the beginning of the year 2017. Figure 3 shows the results of the simulation if the conditions stay the same, meaning the number of judges and assistant judges doesn't change throughout the interval taken into consideration for this analysis. As we can see from the graph, the problem will continue to exist and will become worse in the future. Therefore, future policies will require more effort and will have higher costs for the Administrative Court of Appeal. To test this, we can apply the policy in the SD model since day 1 and observe the results and then apply the policy after the third quarter of 2016 and again observe the results. The time difference requires almost the double number of judges to make the finalized cases rate equal to the registered cases rate.

The backlog is increasing because the number of cases coming from the First Instance Administrative Courts is considerably higher than the finalized cases rate that the current number of judges can complete within the current conditions. Figure 4 shows the simulation results when the short–term policy is applied. As we can see from the graph, the policy alleviates the problem but it doesn't completely address it because the number of assistant judges is bound to the current number of judges and the structure suggests that the number of incoming cases is very high to be fulfilled by the current stock values of judges and assistant judges. Figure 5 shows the simulation results when the long – term policy is applied. In this case, we can say that the problem has been addressed because the volume of the incoming cases is determining the optimal number of judges required. The balancing loop is adjusting the state of the system as a function of the desired state. Figure 6 also addressed the problem and gives the same results as the long–term policy. As discussed above, the difference between the mixed policy and the long-term policy is cost oriented due to the changes in the hiring rate.

3.1. Reflections on the use of SD model over an alternative methodology

The problem can be recreated using an alternative methodology as well. For instance, using a spreadsheet to develop the behavior of the backlog throughout the time interval we were interested in is also a possibility. The simplicity of spreadsheets makes calculations easier to understand by displaying all the steps calculations required for generating the development of the backlog. In addition, people don't need to have some special training to understand how the results were generated as in the case of using System Dynamics as a method. However, using this methodology comes also with some limitations. Firstly, spreadsheets are prone to human errors. It is very easy to insert wrong input data, the wrong formula in the cell or even make mistake in formulating logic equations because the spreadsheets check only when there is a mathematical error in the formula and lack the ability to check the formulas by confirming unit consistency. Thus, logic error in the formulas can't be identified easily.

In System Dynamics, this feature beside helping us in not making mistakes, also serves some time to figure out the connection between the variables. Secondly, it's always difficult to understand and trace back a change in a value that you made by mistake or without paying attention due to the simple interface, which results in reduced accuracy of the analysis. Thirdly, if I would like to apply a policy to fix the problem of the increasing backlog it is impossible to see in live mode the changes that will happen to the backlog as we do by using system dynamics. People can calculate the optimal number of judges required or assistant judges by alternating the mathematical formulas, but if people lack mathematical skills, that's almost impossible or it will require a long time. In System Dynamics, we can apply a policy by playing with the variables in the model and witness in live mode how the changes in that variable affect the backlog. In addition, SD recreates the behavior over time of a variable contrary to the results in a certain point in time of the spreadsheet model.

Finally, spreadsheets don't allow you to identify and create a policy based on the present feedbacks in your system or by adding new feedback loops. To determine the optimal number of judges or number of assistant judges, in the spreadsheet methodology, as mentioned before, we should alter the mathematical formulas to have the required number of judges or assistant judges as result of the backlog and other variables. In system dynamics, we can determine the optimal number of judges or number of assistant judges by creating a policy which feedbacks into the model. Therefore, the variables are determined by the respective feedback loops. In conclusion, although we can put into a scale the advantages and disadvantages of the alternative methodology, people will always choose the methodology they are familiar with and feel comfortable using to stay in their comfort zone.

4. Conclusion

This paper analyzed the dynamics of the backlog of the Administrative Court of Appeal of Tirana, Albania, which has been constantly increasing since the establishment of the Court by using System Dynamics. The increasing backlog problem was successfully portrayed by the methodology used. The developed stock and flow diagram recreated the behavior of the backlog by considering the incoming cases from the First Instance Court and the finalized cases rate generated based on the current capacity of the Court in terms of judges and assistant judges. Because the time frame, starting from 2014, was not enough to give us a realistic explanation of the reasons behind the developed behavior, a trend extrapolation, 5 years into the future was done by using the trend function.

The system dynamics model recreated the behavior of the backlog and helped to identify the endogenous source of the behavior, which was caused by the responsible negative feedback loop ("midnight oil loop", Sterman, 2000) presented in the system. Although the balancing loop is trying to adjust the state of the system as a function of the desired state, the current structure of the court doesn't allow it because the number of assistant judges is bound to the current number of judges and the structure suggests that the number of incoming cases

is very high to be fulfilled by the current stock values of judges and assistant judges. To tackle the problem a short–term policy was applied which alleviated the problem but did not address it completely due to the constraints in the number of judges. In addition, a long–term policy and a mixed policy were applied which both addressed the problem completely. Moreover, the paper presents some reflections on using an alternative methodology for recreating the problem.

Bibliography:

Administrative Court of Appeal. 2014. Reports [ONLINE] Available at: http://www.gjykataadministrativeeapelit.al/?page_id=436. [Accessed 1 October 2016]

Forrester, J. W. (1958). Industrial Dynamics: A Major Breakthrough for Decision Makers. Harvard Business Review 36 (4):37-66.

Forrester, J.W., (1961). Industrial Dynamics, Cambridge, Massachusetts: MIT Press.

Georgiadis, P., & Besiou, M. (2008). Sustainability in electrical and electronic equipment closed-loop supply chains: A system dynamics approach. Journal of Cleaner Production, 16(15), 1665-1678. http://dx.doi.org/10.1016/j.jclepro.2008.04.019

Giannakis. M. (2011). Management of service supply chains with a service-oriented reference model: the case of management consulting, Supply Chain Management: An International Journal, 16(5), pp. 346–361.

High Council of Justice, (2014). Studimi mbi ngarkesen ne Gjykaten Administrative te Apelit- KLD. [ONLINE] Available at: http://kld.al/korniza-ligjore/akte-nënligjore/studimi-mbi-ngarkesen-ne-gjykaten-administrative-te-apelit. [Accessed 1 October 2016]

Law no 101/2014 "On the organization and functioning of the High Council of Justice", entered into force 15 August 2014.

Law no 49/2012 "On the Organization and Functioning of Administrative Courts and the Adjudication of Administrative Disputes", entered into force 18 May 2012, amended by Law no 100/2014.

Luis López, Roy Zúñiga, (2014). Dynamics of judicial service supply chains, Journal of Business Research, Volume 67, Issue 7, Pages 1447-1454, ISSN 0148-2963, http://dx.doi.org/10.1016/j.jbusres.2013.07.022.

Lusch, R. F., S. L. Vargo, eds. (2006). The Service-Dominant Logic of Marketing: Dialog, Debate, and Directions, M.E. Sharpe.

Richardson, G.P. & Pugh III, A.I., (1981). Introduction to System Dynamics Modeling with Dynamo.

Sakhuja, S., Jain, V, (2012), Service supply chain: an integrated conceptual framework, CIE42 Proceedings, 16-18 July 2012, Cape Town, South Africa, CIE & SAIIE.

Senge, P. M (1990). The Fifth Discipline: The Art and Practice of the Learning Organization, New York: Doubleday Business.

Senge, P.M., (1997). The Fifth Discipline. Measuring Business Excellence, 1(3), pp.46– 51.

Sherwood, M. (1994). Difficulties in the measurement of service quality. Monthly Labour Review.

Spohrer, J., P. Maglio, J. Bailey, D. Gruhl. (2007). Steps toward a science of service systems. IEEE Computer Magazine (January) 71-77.

Sterman, J. (2000). Business dynamics: systems thinking and modeling for a complex world. Boston, Irwin/McGraw-Hill.

Wu, H., Yang, S. (2009). Service Supply Chain: A Conceptual Framework Compared with Manufacturing Supply Chain, International Conference on Management and Service Science (MASS), IEEE, pp. 1-4.