

# Comparison of Behavioral Similarity use TARs and Naïve Algorithm for Calculating Similarity in Business Process Model

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**Abstract**—Every organization needs one or more business processes to support the analysis, redesign, and implementation of an activity. Problems that occur when one or more business processes have in common that should identify the effectiveness and efficiency of the models from different processes. A common process model is determined by calculating the similarity of some business process model using a specific algorithm. This observation aims to compare two algorithms to calculate the value of behavioral similarity using Transition Adjacency Relations (TARs) and Naïve. From that comparison, we will find a suitable algorithm to calculate the value of that behavioral similarity. In this experiment, the authors will analyze the similarity of process models based on their behavior by comparing them using TARs and Naïve. The result of the behavioral similarity calculation with TARs algorithm is 0.36. Whereas the similarity calculated using naïve algorithm is 0.3016. Looking at the calculation of the similarity between these two algorithms, the value of the naïve algorithm is lower. From that, we concluded that between TARs and Naïve, TARs is superior. There are many possible causes for a low similarity value in Naïve, one of them is because the two models of business process is different when viewed by behavioral standpoint. Furthermore, it is likely influenced by the structure of a more complex business process model.

**Keywords**—behavioral similarity; Naïve method; TARs method; model process

## I. INTRODUCTION

Business process is a process flow that supports the activities of a company in its operations. A company with a multinational scale will surely have a diverse business process models with thousands of business processes. A variety of business process is used to support Enterprise Resource Planning (ERP). The purpose of the business process is to improve the effectivity and efficiency of the company. With growing competition in the business world, every company should be quick in responding both to competitors and customers. This certainly will impact on more complex business processes and can consume a lot of resources. Meanwhile, designing a business process can take a considerable amount time. Some companies even require a long time to create a business process model that can be set for either. The condition of many business process model are certainly varied, requiring more resources for it to be

developed. There is a possibility for a business process model to encounter problems during its development stage, such as the duplication of data due to the iterative process, inefficiency, difficulties in control, and so on. With those problems, the required prevention step is to search for common business process models. Commonality or similarity can be obtained by performing specific calculations that can be used to analyze a business process model [1-5].

In calculating the similarity of several business process models, there are several methods of approach that can be done, such as structural similarity, behavioral similarity, and semantic similarity [6]. Among the various methods of similarity, behavioral similarity is a similarity search for efficient business process model [7]. In the method of behavioral similarity there are many algorithms that can be used. In this paper, the algorithm compares the behavioral similarity between Transition Adjacency Relations (TARs) and Naïve Behavioral Similarity (NBS). TARs is the optimal algorithm to obtain the value of similarity with the excess cheap in the cost of computing. Meanwhile NBS calculates similarity of business process models by looking at a sequence similar processes in the process model [8-11].

## II. LITERATURE REVIEW

There are several things that underlies this experiment. The fundamentals of the theory behind the experiment include the Behavioral Similarity algorithms using Naïve algorithm and TARs algorithm.

### A. Behavioral Similarity using TARs Algorithm

Behavioral Similarity is a similarity measurement based on the behavioral relationships between business processes. Value behavioral similarity algorithm TARs obtained from the relation between the existing activities. The relation of this activity can also be interpreted as a sequence of execution that may occur. In the term referred to as the Transition Adjacent Relations (TARs). The formula for TARs methods is shown on (1).

$$\text{similarity} = \frac{(\text{Amount of Similar TARset})^2}{\text{TARset activity 1} \times \text{TARset activity 2}} \quad (1)$$



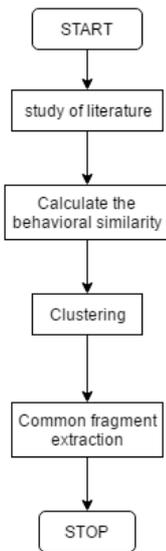


Fig. 3. Flow Experimental Procedure.

At this stage of the calculation of behavioral similarity by TARs, sample data petri net models derived respectively transition values. Then, through the value of the transition will be established TARset value, namely those executions relation derived from a combination of two grades of transition. Flow calculation process of behavioral similarity by TARs described in Fig. 4.

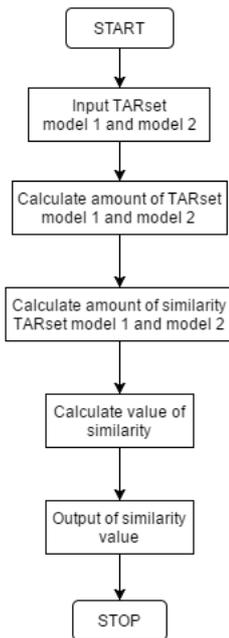


Fig. 4. Flow Calculation of Behavioral Similarity use TARs.

Then each petri net model of clustering process is carried out of the results of the behavioral similarity. The process of clustering is grouping based on threshold or the process for

selecting the value of behavioral similarity by comparing the threshold value with the value of behavioral similarity. This process is useful to get the value of behavioral similarity in accordance with the threshold value, so it will get results of clusters corresponding to the common extraction process fragment. Value behavioral similarity is more than the threshold value can be said to qualify clusters, while less than that do not qualify for clusters. Chronology of clustering shown in Fig. 5.

After the clustering process, the determination of the common fragment is done with reference to the cluster. Results the clusters form of behavioral similarity value is more than or equal to the threshold value. Based on the value of behavioral similarity are clustered, then taken TARset value each cluster and then do searching TARset the same on all cluster. If there TARset is the same for all cluster, it will do the extraction and model it back in the form of a Petri net [2].

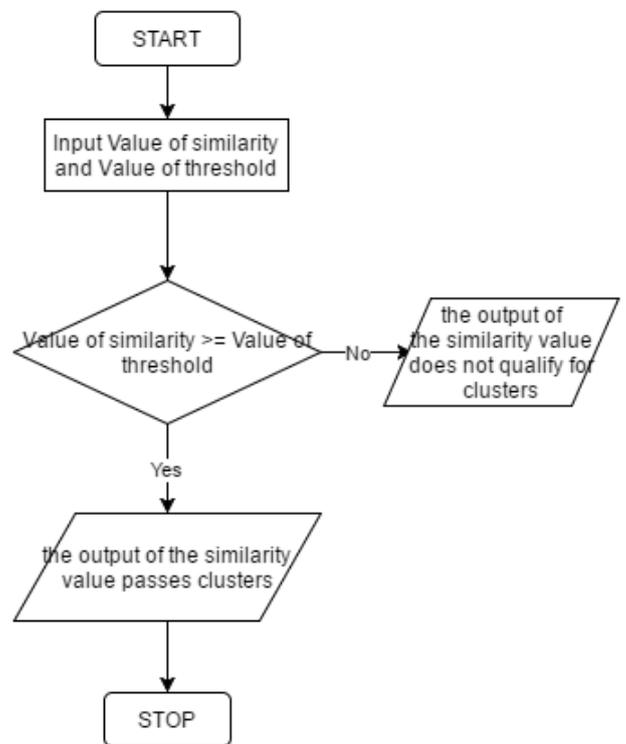


Fig. 5. Flow of Clustering.

Naïve calculation algorithm is performed by several stages in sequence. Starting from the extraction process models. Furthermore, the process of calculating the similarity based on the similarity matrix node, structure, and behavior. After that process grouping process model based on the proximity of similarity. One final stages of the validation process cluster formed.

IV. RESULT AND DISCUSSION

A. Naïve Behavioral Similarity

This experiment uses two models petri net, which is a KAI Access model application and Tokopedia Ticket. Petri net value of each activity are taken together along with the same amount of activity. This is done for behavioral similarity calculation process, which requires the same amount of activity between model 1 and model 2 as well as the same amount of activity of both models.

Fig. 6, is a drawing table to search any related activity. This process is carried out as it aims to find the value of the same activity in the process model KAI Access. On the table there is a column of blue that has a value of 1 means the two activities are related. The amount of associated activities as much as 32.

Proses Model KAI Access																													
	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	a15	a16	a17	a18	a19	a20	a21	a22	a23	a24	a25	a26	a27	a28	a29
a1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 6. Looking for the same amount of activity on the model KAI Access.

Fig. 7, shows the couple interconnected activities in the process model KAI Access. Pairs the same activity will be used to look for similarities with the same activities in the business process model of Tokopedia Tickets.

KAI Access	a1a2	a2a3	a2a4	a3a5	a4a6	a5a7	a6a8	a7a9
	a6a11	a9a10	a10a12	a11a12	a12a13	a13a14	a14a15	a14a16
	a15a16	a16a17	a17a18	a17a19	a17a20	a18a21	a19a22	a20a23
	a21a24	a22a25	a23a26	a24a27	a25a27	a26a27	a27a28	

Fig. 7. Activity same value on the model KAI Access.

Fig. 8, shows a table used to find the value of the same activity in the process model Tokopedia Tickets. In the table in Fig. 8, there is a column which shows the value of 1, signifying that related activities. There are 31 associated activities.

Proses Model Tokopedia Tiket																												
	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	a15	a16	a17	a18	a19	a20	a21	a22	a23	a24	a25	a26	a27	a28
a1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
a29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 8. Looking at Process Model Number TARset Tokopedia Tickets.

Fig. 9, shows several interconnected activities in the process model of Tokopedia Tickets. It pairs the same activity, which will be used to look for similarities in the couple with the same activity in the process model of KAI Access.

The results of similarity between the process models KAI Access and Tokopedia Tickets use Naïve algorithm is 0.3016.

**B. TARs Behavioral Similarity**

This experiment uses two models namely petri net petri net models KAI Access application and Tokopedia Tickets. Each model Petri net taken TARset value and the amount of TARset. This is done for behavioral similarity calculation process, which requires the number TARset model 1 and model 2, and TARset amount that same of both models.

In Fig. 11, there are blue table column shows the value of 1, which means that activity relates. The number of associated activities as much as 32. This process is carried out as it aims to find the value TARset the process model KAI Access.

Proses Model KAI Access																															
	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	a15	a16	a17	a18	a19	a20	a21	a22	a23	a24	a25	a26	a27	a28	a29		
a1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
a28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Fig. 11. Looking for at Process Model Number TARset KAI Access.

In Fig. 12, shows the pair of interconnected activities in the process model KAI Access. Pairs the same activity will be used to look for similarities with the same activities in the business process model of Tokopedia Tickets.

KAI Access	a1a2	a2a3	a2a4	a3a5	a4a6	a5a7	a6a8	a7a9
	a8a11	a9a10	a10a12	a11a12	a12a13	a13a14	a14a15	a14a16
	a15a16	a16a17	a17a18	a17a19	a17a20	a18a21	a19a22	a20a23
	a21a24	a22a25	a23a26	a24a27	a25a27	a26a27	a27a28	

Fig. 12. Value TARset the Process Model of KAI Access.

In Fig. 13, shows a table used to find value in the process model Tokopedia Tarsset Tickets. In the table in Fig. 13, there is a column that is red, it shows the value of 1, which means that activity relates. The number of associated activities as much as 31.

Proses Model Tokopedia Tiket																															
	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	a15	a16	a17	a18	a19	a20	a21	a22	a23	a24	a25	a26	a27	a28			
a1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

Fig. 13. Looking for at Process Model Number TARset Tokopedia Tickets.

Tokopedia Tiket	a1a2	a2a3	a3a4	a4a5	a5a6	a5a7	a6a8	a7a9
	a8a10	a9a11	a10a12	a11a12	a12a13	a13a14	a14a15	a15a16
	a15a17	a16a18	a17a18	a18a19	a18a20	a18a21	a19a22	a20a23
	a21a24	a22a25	a23a26	a24a27	a25a28	a26a28	a27a28	a28a29

Fig. 14. Same values Activity of process model Tokopedia Tickets.

From calculations based on the above formula, the value of similarity between the process models KAI Access and Tokopedia Tickets Tars algorithm is 0.36.

## V. CONCLUSION

Based on the experiments and discussion of behavioral similarity use Naïve algorithm and TARs algorithm on KAI Access business process models and Tokopedia Ticket, it can be concluded that:

1. In performing behavioral similarity calculation using algorithm transition adjacency relations (TARs), generate value similarity 0.36. The value includes the value of similarity is low. Because of the similarity value of 1 if the model using the same.
2. In performing behavioral similarity calculation using the algorithm Naïve, generate similarity values 0.316. These values are below average.
3. Judging from the calculation of the value of similarity between these two algorithms, the value of similarity is low. There is a possibility similarity value low for two models of the business process is different when viewed from the standpoint of behavior. In addition, likely influenced by the structure of the business process model highly complex.

In future experiments using the same algorithm, you should expand the number and type of business process models in order to better know the advantages and disadvantages of transition adjacency relations and Naïve. In addition to adding the data model of the process, adding the algorithm for calculating the value of behavioral similarity, for the purpose of comparing the results of measurements of behavioral similarity with several different algorithms. Also in the calculating the value of similarity search for more detail in each phase.

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