Ninth Int. Workshop on GNs, Sofia, 4 July 2008, 80-83

Modelling of the activity of a travel agency

H. Stoichev[1], D. Orozova[1, 2]

[1] Bourgas Free University, -8000, Bulgaria
e-mail: orozova@bfu.bg
[2] CLBME - Bulgarian Academy of Sciences,
Acad. G. Bonchev Str., Bl. 105, Sofia-1113, Bulgaria

Abstract: In this paper is presented system for activity of a travel agency. Following a Generalized Net modelling the real process of communication in the system is created. This net gives us the opportunity to use the implementation of various analyses and statistics in order to generate ideas for enhancing this system.

Keywords: Generalized nets, Modelling, activity of a travel agency.

1. Introduction

„Tour operator activity" is one of the most developed enterprises in the Bulgarian Black sea region and our mountain resorts. Its modelling through the apparatus of Generalized nets will lead to various advantages:

- An opportunity to improve the services for the clients;
- Saving time and effort of the people working with the product, which in turn leads to increased efficiency of work;
- To identify the weak spots in the process, starting from the client's arrival offering lodgings (apartments, rooms) and accomodating the tourists in them.

We are modeling the following process:

1. At the arrival of new client personal data is recorded as well as detailed information for the offered lodgings.
2. A query to the database is made to check if the offer exists, if not – offer prices are negotiated and pictures of the proposed lodgings are taken.
3. The offers are proposed to potential clients; the client may be from other travel agency
4. Contracts with the clients are made and the dates of arrival and accomodation are settled, and the offers are marked as reserved for the period of the stay.
5. Next comes accomodating the clients and payment to the owner, which may take place at earlier period..

2. Generalized net model of the process

The enterprise „Tour Operator activity" may be presented by the following model. The general model contains the set of transitions:

$$A = < Z_1, Z_2, Z_3, Z_4, Z_5, Z_6, Z_7 >,$$

Whers the transitions describe the following processes:

Transition Z_1 – a potential client arrives and requests the terms and practical activities of the firm.

Transition Z_2 – a review of the available lodgings and quering the databases for the availability of the offers, for gathering of information and pictures.

Transition Z_3 – negotiating the prices and recording the offer in the database.

Transition Z_4 – offers to potential clients are proposed, a review of the available free (unreserved) offers is done.

Transition Z_5 – contract is made with the client (firm), the dates for accomodating are settled and the offers are declared as reserved for the duration of stay.

Transition Z_6 – accomodating the clients.

Transition Z_7 – leaving the lodgings and paying to the owner The clients of the firm enter through place l_0. The tokens entering places l_2 and l_3 receive characteristic „*agreeing with the terms of the firm"* and go to the next place, presentation of the proposed offers. In place l_4 the clients obtain characteristic „*still considering*", and in place l_1 they obtain characteristic „*not agreeing with the terms of the firm*" and they leave the net. The transition Z_1 describing the requests of clients for the terms and the activities of the firm is of the following type.

$$Z_1 = < \{l_0,l_4\}, \{l_1,l_2,l_3\}, r_1, V (l_0, l_4) >$$

$r_1 =$

	l_1	l_2	l_3
l_0	$w_{0,1}$	false	$w_{0,3}$
l_4	$w_{4,1}$	$w_{4,2}$	false

where:

$w_{0,1}$ = „The client does not agree with the terms of the firm and withdraws".

$w_{0,3}$ = „The client agrees with the terms of the firm".

$w_{4,1}$ = „The client is still considering and does not accept the terms".

$w_{4,2}$ = „The client is still considering and accepts the terms of the firm".

The transition Z_2 is of type:

$$Z_2 = < \{ l_2, l_3, l_7 \}, \{ l_5, l_6 \}, r_2, V (l_2, l_3, l_7) >$$

$r_2 =$

	l_5	l_6
l_2	$w_{2,5}$	$w_{2,6}$
l_3	$w_{3,5}$	$w_{3,6}$
l_7	$w_{7,5}$	$w_{7,6}$

where:

$w_{2,5}$ – „Client, whose conditions in the offered lodgings were not apporved".

$w_{2,6}$ – „Client, whose lodgings were approved".

$w_{3,5}$ – „Client, whose conditions in the offered lodgings were not apporved".

$w_{3,6}$ – „Client, whose lodgings were approved".

$w_{7,5}$ – „Client with recommendations for improving the quality of lodgings which he fails to address and is not apporved".

$w_{7,6}$ – „Client who has fulfilled the recommendations and is approved".

The transition Z_3 is of type:

$$Z_3 = <\{l_6\}, \{l_8, l_9\}, V(l_6)>$$

$r_3 =$

	l_8	l_9
l_6	$w_{6,8}$	$w_{6,9}$

where:

$w_{6,8}$ – „Negotiation has not been reached”.
$w_{6,8}$ – „Negotiation has been reached, recording the offer to the database”.
The transition Z_4 is of type:

$$Z_4 = <\{l_9, l_{10}, l_{14}, l_{18}\}, \{l_{11}, l_{12}, l_{13}\}, V(l_9, l_{10}, l_{14}, l_{18})>$$

$r_4 =$

	l_{11}	l_{12}	l_{13}
l_9	$w_{9,11}$	false	false
l_{10}	false	$w_{10,12}$	$w_{10,13}$
l_{14}	$w_{14,11}$	false	false
l_{18}	false	$w_{18,12}$	$w_{18,13}$

where:
$w_{9,11}$ – „The offer is approved”.
$w_{10,12}$ – „The cleint is unsatisfied with the available offers”.
$w_{10,13}$ – „The client has approved an offer”.
$w_{14,11}$ – „The client is with offer awaitng approval”.
$w_{17,12}$ – „Client that has made a reservation due to some reason forfeits the services of the firm”.
$w_{17,13}$ - „Client that has not made reservation due to some reason, approves new offer”.
The transition Z_5 is of type:

$$Z_5 = <\{l_{11}, l_{13}\}, \{l_{15}, l_{16}, l_{17}\}, V(l_{11}, l_{13})>$$

$r_5 =$

	l_{15}	l_{16}	l_{17}
l_{11}	$w_{11,15}$	false	false
l_{13}	false	$w_{13,16}$	$w_{13,17}$

$w_{11,15}$ – „The client is with reserved offer”.
$w_{13,16}$ – „The client has made a reservation”.
$w_{13,17}$ – „ Client, that has not made reservation due to some reason, reviews again available offers”.
The transition Z_6 is of type:

$$Z_6 = <\{l_{15}, l_{16}, l_{21}\}, \{l_{18}, l_{19}, l_{20}\}, V(l_{15}, l_{16}, l_{21})>$$

$r_6 =$

	l_{18}	l_{19}	l_{20}
l_{15}	$w_{15,18}$	false	false
l_{16}	false	$w_{16,19}$	$w_{16,20}$
l_{21}	false	$w_{21,19}$	$w_{21,20}$

References:

[1] K. Atanassov, Intuitionistic Fuzzy Sets, Springer Physica-Verlag, Berlin, 1999.
[2] K. Atanassov, Generalized index matrices. - Compt. Rend. de l'Academie Bulgare des Sciences, Vol.40, 1987, No 11, 15-18.
[3] K. Atanassov, G. Pasi and R. Yager. Intuitionistic fuzzy interpretations of multi-person multi-criteria decision making. Proceedings of 2002 First International Symposium Intelligent Systems, Vol. 1, 115-119.

[4] Atanassov,K., G. Pasi and R. Yager. Intuitionistic fuzzy interpretations of multi-criteria multi-person and multi-measurement tool decision making. International Journal of Systems Science, Vol. 36, 2005, No. 14, 859-868.

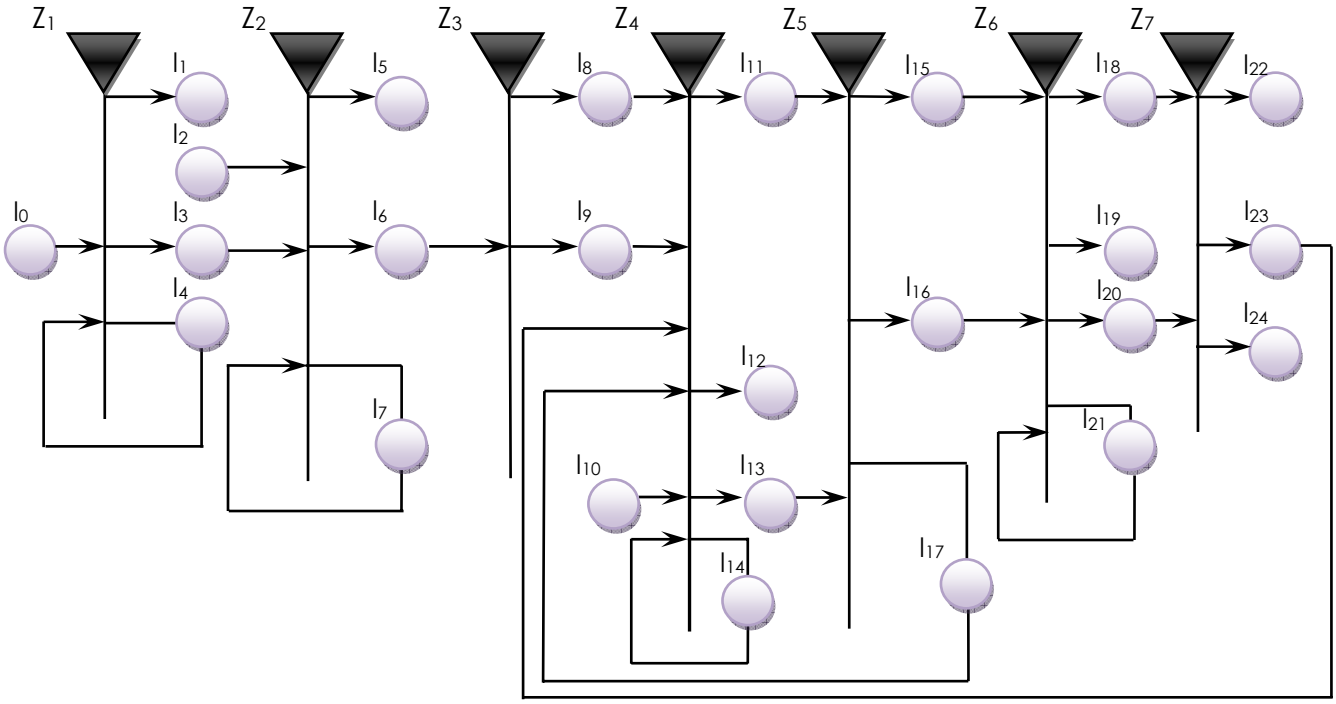

Fig.1. GN model of the tour operator's firm activity.