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Generalized net model of the development of an Adobe Flash project

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Abstract: Adobe Flash is the one of the most usable program products for creating multimedia and advertisements. This article describes the development of an Adobe Flash project. All stages are modeling. The generalized net apparatus is used to create a model of the processes and the structure needed to build up a Flash project.
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1 Introduction

Adobe Flash is a multimedia and software platform used for authoring of vector graphics, animation, games and rich Internet applications (RIAs) that can be viewed, played and executed in Adobe Flash Player [4]. Flash is frequently used to add streamed video or audio players, advertisement and interactive multimedia content to web pages, although usage of Flash on websites is declining [5].

Flash manipulates vector and raster graphics to provide animation of text, drawings, and still images. It allows bidirectional streaming of audio and video, and it can capture user input via mouse, keyboard, microphone and camera. Flash applications and animations can be programmed using the object-oriented language called ActionScript. Adobe Flash Professional is the most popular and user-friendly authoring tool for creating the Flash content, which also allows automation via the JavaScript Flash language (JSFL).

Adobe Flash provides very good tools for the production of advertisements and animations. Creating a Flash project for a website or an animated advertisement is always a benefit when trying to promote a product. The development of a Flash project is a process which requires a lot of time and concentration, in order to fulfill the customer's wishes are and to satisfy them with the result. The development of such a project is expensive and complex and substantial amounts of time are usually required for the project's completion. A lot of complications arise from the many details one must pay attention to while developing the project.

To analyze this process better, we can apply the apparatus of generalized nets (GN).

2 Generalized net model

Fig. 1 shows a GN model which represents each stage of the development of a Flash project. The GN model contains the following set of transitions:

$$A = \{Z_1, Z_2, Z_3, Z_4, Z_5, Z_6\}$$

The transitions describe the following processes:

- Z_1 = “Planning and approval of the project”;
- Z_2 = “Creating of project”;
- Z_3 = “Adding Timelines and slide shows”;
- Z_4 = “Adding Audio and subtitles”;
- Z_5 = “Creating and managing links”;
- Z_6 = “Building and testing the final product”.

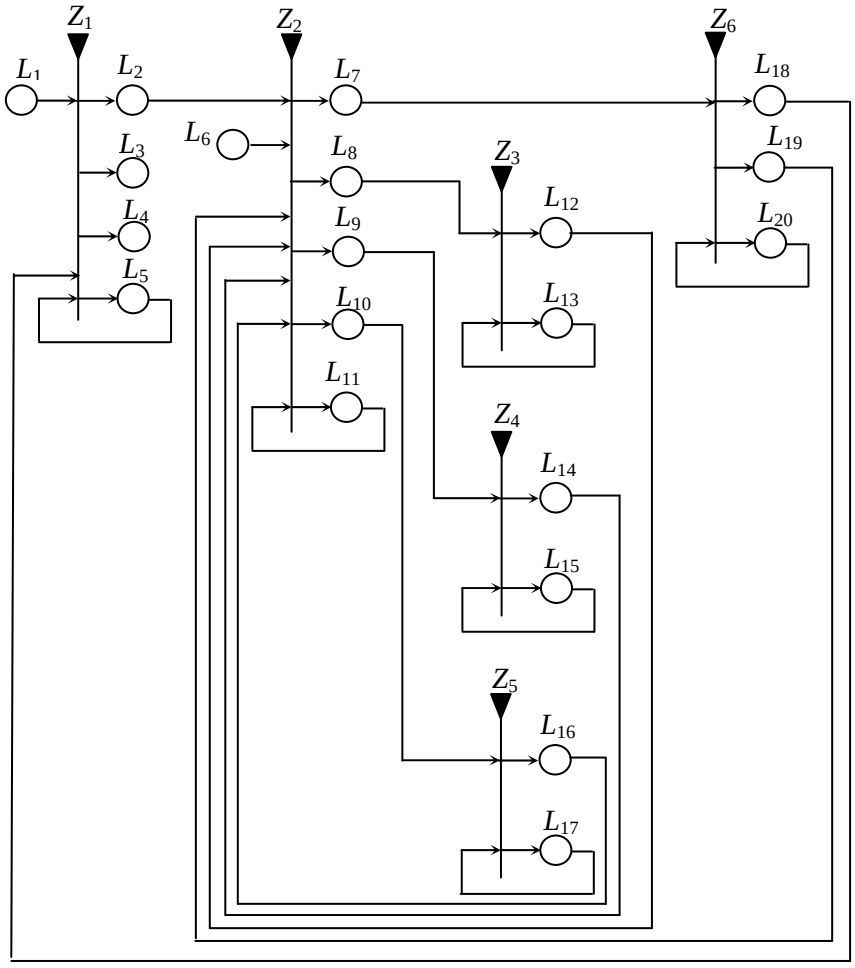

Figure 1. Generalized net model of the creating of a flash project

Initially, in place L_{20} there is one δ-token. It will remain in this place during the whole time of GN functioning. It has the following characteristic: “*Criteria for testing and assessment of the Flash project*”.

Token α_1 enters the net via place L_1 with initial characteristics: "*The clients' requirements for the Flash project*".

The transitions are described as follows.

$$Z_1 = \langle \{L_1, L_5, L_{18}\}, \{L_2, L_3, L_4, L_5\}, R_1, \vee(L_1, L_5, L_{18}) \rangle$$

$$R_1 = \begin{array}{c|cccc} & L_2 & L_3 & L_4 & L_5 \\ \hline L_1 & False & False & False & True \\ L_5 & W_{5,2} & W_{5,3} & W_{5,4} & True \\ L_{18} & False & False & False & True \end{array},$$

where:

- $W_{5,2}$ = "A project is planned for creating",
- $W_{5,3}$ = "A project is rejected",
- $W_{5,4}$ = "A project is approved form client".

The α-tokens, entering in place L_5 do not obtain new characteristic. The α_2-, α_3- and α_4-tokens tokens that enter places L_2, L_3 and L_4 obtain characteristics respectively: "*Project with planed content, size and quality of file and bit budgeting*" in place L_2, "*Rejected project*" in place L_3, and "*Finished project*" in place L_4.

Token α_5 enters the net via place L_6 with initial characteristics: "*External resources for the Flash project (pictures, animations and ect.)*".

$$Z_2 = \langle \{L_2, L_6, L_{11}, L_{12}, L_{14}, L_{16}, L_{19}\}, \{L_7, L_8, L_9, L_{10}, L_{11}\}, R_2, \vee(L_2, L_6, L_{11}, L_{12}, L_{14}, L_{16}, L_{19}) \rangle$$

$$R_2 = \begin{array}{c|ccccc} & L_7 & L_8 & L_9 & L_{10} & L_{11} \\ \hline L_2 & False & False & False & True & True \\ L_6 & False & False & False & True & True \\ L_{11} & W_{11,7} & W_{11,8} & W_{11,9} & W_{11,10} & True \\ L_{12} & False & False & False & False & True \\ L_{14} & False & False & False & False & True \\ L_{16} & False & False & False & False & True \\ L_{19} & False & False & False & False & True \end{array},$$

where:

- $W_{11,7}$ = "There is a project for building and testing",
- $W_{11,8}$ = "There is a project for timelines and slide shows",
- $W_{11,9}$ = "There is a project for audio and subtitles",
- $W_{11,10}$ = "There is a project for managing links".

The tokens, entering in place L_{11} do not obtain new characteristic. The α-tokens that enter places L_7, L_8, L_9 and L_{10} obtain characteristics respectively:

"*Project for building and testing*",
"*Project for timelines and slide shows*",
"*Project for audio and subtitles*",

"*Project for managing links*".

$$Z_3 = \langle \{L_8, L_{13}\}, \{L_{12}, L_{13}\}, R_3, \vee(L_8, L_{13}) \rangle$$

$$R_3 = \begin{array}{c|cc} & L_{12} & L_{13} \\ \hline L_8 & False & True \\ L_{13} & W_{13,12} & W_{13,13} \end{array},$$

where:

- $W_{13,12}$ = "The project have timelines and slide shows",
- $W_{13,13} = \neg W_{13,12}$.

The tokens, entering in place L_{13} do not obtain new characteristic. The α-token that enters place L_{12} obtains characteristic: "*Project with timelines and slide shows*".

$$Z_4 = \langle \{L_9, L_{15}\}, \{L_{14}, L_{15}\}, R_4, \vee(L_9, L_{15}) \rangle$$

$$R_4 = \begin{array}{c|cc} & L_{14} & L_{15} \\ \hline L_9 & False & True \\ L_{15} & W_{15,14} & W_{15,15} \end{array},$$

where $W_{15,14}$ = "The project have audio and subtitles".

The tokens, entering in place L_{15} do not obtain new characteristic. The token that enters place L_{14} obtains characteristic: "*Project with audio and subtitles*".

$$Z_5 = \langle \{L_{10}, L_{17}\}, \{L_{16}, L_{17}\}, R_5, \vee(L_{10}, L_{17}) \rangle$$

$$R_5 = \begin{array}{c|cc} & L_{16} & L_{17} \\ \hline L_{10} & False & True \\ L_{17} & W_{17,16} & W_{17,17} \end{array},$$

where:

- $W_{17,16}$ = "The project have managing links",
- $W_{17,17} = \neg W_{17,16}$.

The tokens, entering in place L_{17} do not obtain new characteristic. The token that enters place L_{16} obtains characteristic: "*Project with managing links*".

$$Z_6 = \langle \{L_7, L_{20}\}, \{L_{18}, L_{19}, L_{20}\}, R_6, \vee(L_7, L_{20}) \rangle$$

$$R_6 = \begin{array}{c|ccc} & L_{18} & L_{19} & L_{20} \\ \hline L_7 & False & False & True \\ L_{20} & W_{20,18} & W_{20,19} & W_{20,20} \end{array},$$

where:

- $W_{20,18}$ = "A project was created",
- $W_{20,19}$ = "A project needs some corrections",
- $W_{20,20} = \neg W_{20,18}$.

The tokens, entering in place L_{20} do not obtain new characteristic. The tokens enter places L_{18} and L_{19} obtain characteristics respectively: "*Project for client's approval*" and "*Project for corrections*".

3 Conclusion

In the paper was constructed a generalized net model of the steps needed to develop an Adobe Flash project from the moment of order by a customer to the moment of its publication as a final product on the Internet or its delivery to the customer. In this case, we use a generalized net to show all activities that take place during the development stage. Each stage of the construction of the project can be considered in further detail.

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