RESEARCH ON THE WORK ENVIRONMENT DATA ACQUISITION IN AUTOMATIC MODE AND USE OF THE ERP SYSTEMS

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Abstract: The effective functioning of an automated system is dependent on its ability to gather information from the operating environment and to use enterprise resource planning in a more appropriate way. Information acquisition is done through sensors and hardware interfaces then transferred and stored on servers in the data stream of ERP systems through software interfaces. This paper aims to highlight how data is acquisitioned from the work environment and its processing in order to be inserted in the flow of ERP systems.

Keywords: ERP, sensors, data acquisition, information flow

1. INTRODUCTION

An Enterprise Resource Planning (ERP) is a complex software package (Fig. 1), used in managing a variety of processes that occur in a company. In the production process [2] planning takes account of sale orders and sale orders raw resources for optimal use of existing production lines. Also in this category enter features such as demand or supply equipment for interfacing with various data acquisition and real time monitoring of production parameters. Combining these features, ERP helps to shorten time to market a product, compliance orders production, increase quality and reduce costs, strategic objectives for any producer.

2. EXPERIMENTAL EQUIPMENT

Data acquisition for introduction in ERP systems (Fig. 2) was achieved in a manufacturing cell [3] whose structure consists of a Casting supply system- FMS 350 with three stations of storage and a drill GP 45 NC.

Fig. 1. Module ERP

Fig. 2. General block scheme corresponding to the application's information system

2.1. Presentation of the general structure of the cell manufacturing

The main elements of the flexible cell (Fig. 3) are storage posts (1) supply system, transportation, transfer (2) drill fitted with a paddle lock on the table (3).

The food, transportation, transfer [1] FMS 350 is based on the drilling machine CNC CN 45 GP.

It achieved, using 3 kinematic chains, the blades transfer with semi-finished parts from the storage positions to the machine table tools and after completion of this operation, the machined parts are transferred from the machine table to the storage stations.

Fig. 3. Flexible manufacturing cell - virtual model

2.2. Description of power system functioning, transport, transfer FMS 350

Phases of work for the mass transfer pallets with semi machine tools are described below:

- Positioning of the transfer station right storage.
- Extension arms transfer system to take over the blade with semi.

- c. Blocking the transfer system palette followed by withdrawal of arms to Castings.
- d. Rotating the transfer system and its positioning in the right workstation.
- e. Extension arms with a view to transfer its semifabricating piece on machine table tools.
- f. Blocking tool palette on the machine table.
- g. Release of the transfer system palette.
- h. Withdrawing arms transfer system.

2.3. General structure of power, transport, transfer FMS 350

Housing type parts are processed, the blades are positioned on the machine table by means of a locking system (Fig. 4).

Stocking stations, three in number, are embedded in a common support, position adjustment can be done individually. Each workstation is equipped with a second set of limiting the role of referral of this range (Fig. 5).

Blades, with sides of 350 mm, clamping surface have practiced M8 holes and holes for the transfer system and the inner surface of the guidance system and bilateral holes for connection to the system block (Fig. 6).

Robocar (Fig. 7) is made welded and can move in longitudinal direction on a stand with it. The grip on foundation support rails and storage stations is classic, allowing horizontal and vertical adjustment.

Actuators corresponding to the three kinematic chains are AC. Shelf guides are roller elements. Bevel gear (Fig. 8) allow for rotation direction changing horizontal screw-nut mechanism that move on both sides of the shelf-piece port blades.

Fig. 4. a) Semi-finished piece, b) Working post blocking system

Fig. 5. a – Storage stations, b – Electromechanical limiters

Fig. 6. The palette

Fig. 7 The robocar

Fig. 8. Bevel gears

Fig. 9. Electric schema of the drive system

2.4. Control system actuating power, transport, transfer FMS350

Power system control, is made from a PLC [4], power electronics is represented by relays of both actuators and linkages to help block range electromagnets on the transfer system and in the workstation. The electric scheme of drive system is shown in Figure 5.

- DP-movement trolley;
- RT-rotation of the pallets retrieval system;
- TR-translation retrieval system palettes;
- CST-move to left;
- CDR-move to right;
- BST-set left electromagnet;
- BDR-set right electromagnet;
- 1- Set the coil right;
- 2 -Transfer-taking range;
- 3 -Rotating blades system takeover;
- 4 -Movement trolley;
- 5-Ground;
- 7- Turn left coil;
- 8 -Contact activation movement right;
- 9 -Contact activation movement left.

3. DATA ACQUISITION IN THE WORKING ENVIRONMENT

Identification of parts that are to be processed is using radio frequency identification [6]. Thus each pallet is placed at a tag that allows identification.

files. If no data is written to the file then it will create a new file.

Following the acquisition of data files were made in the figure 13 put the folder structure specified in the general structure of this file. The contents of a file is shown in figure 14.

Thus using Tables Generator created a database in SQL Server with the configuration shown in figure 15.

In this structure will enter data from each station to pay measurement data to an event. The software allows connection of 5 sensors, so the columns of this table will be provided the following data:

Fig. 12. Acquired data in software application

Fig. 13. Files created by application

Fig. 14. Data written in file

- IDdm-IDregistration;
- IDpost-JobID from which to retrieve data;
- IDs1-IDs5-ID the five sensors on this post;
- VALs1-VALs5 - taken from a measurement value from these sensors;
- DATAadm-date of event measurement was taken;
- ERRdm-an error code if an error occurs in the data input.

Data to be entered in the database will be set up work area connection to the database. Data acquired by the application are thus introduced into the appropriate database table LIP_DM.

Fig. 15. Tables created in Priority environment

Fig. 16. Writing data in software application

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5. CONCLUSION

The control panel of the supply, transport, transfer systems has been upgraded to operate in automatic mode.

RFID tags have been mounted on palettes so any palette can be identified.

Using the RFID readers have been taken information regarding the highlights positioned on the palettes. These information refer to weight, shape and the number of operations made on one object. After acquisition, the data is automatically processed in specially designed tables in Priority, the enterprise resource planning software. Therefore these table will contain information about each highlights.

Further more, the data base transfer of the ERP would need the restructuring of the data and reports flow.

In future, the data acquisition will be made using more complex structures which will include processing centers, supply, transport and storage systems.

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