of Toyota Production System but with longer use of the documents they evolve, leading to significant deviations from the original design. The authors decided to identify the key elements of Standardized Work Sheet occurring both in literature and in documents used by manufacturing enterprises. The quantitative characteristics of the frequency of elements allow to classify most commonly used – maybe the most importantones. The authors focusedalsoon the elements that appear sporadically in the documentation because they suspect that those elements may also contain information which are important for the process.

The execution of the research included both a literature analysis of the documents (authors such as: Dennis, Liker and Meier, Niederstadt and The Productivity Press Development Team) as well as an analysis of documents used by manufacturing companies (15 sheets). Based on the collected results the authors identified:

– 23 elements of the Standardized Work Sheet contained in the literature,

– 43 Elements of the Standardized Work Sheet contained in enterprises.

Authors pay particular attention to high discrepancies number of elements, identified in both sheets (used by enterprises and presented in literature).

The identified elements of Standardized Work Sheet with their percentage share of the occurrence in all examined documents are shown in the Table 1.

5. The results of the research

The results of the literature's research suggest that in all analyzed documents (the participation rate of 100 %) are presented an overview of the process, such as organizational unit name, the name of the test process, as well as key points, indicating the specific aspects of quality, safety performance of each task. The relatively high share of 80 % present items that contain detailed information about the process, such as a list of the operations performed, takt time, cycle time and date of issue, which, according to the concept of Lean Manufacturing,are the basis to improve production processes in the enterprise.

Thelowestlevelofparticipationarecharacterized by indirect information about the analyzed process, such as: the name of the process executed before and after the analyzed process, the data that identify the operator or shift. It should be noticed that some elements such as name of a part and the total cycle time are also characterized by a low frequency of occurrence in the templates presented in the literature. However, this situation may be caused by occurrence corresponding information in different form of presentation. That's why the document uses only one data in order not to duplicate the information and maintain the readability of the document.

The results obtained from the research performed on manufacturing enterprise's documents suggest that in all the analyzed documents appear general informationofthe process, such as: the name of company or the organizational unit. Most companies (share of 73 %) placed in their sheets details information about analyzed process, such as: cycle time, date of issue, a list of the performed tasks, the duration of the tasks performed by the employee, work flow chart or key points, which are the six elements as may be necessary to use each sheet of the Standard Work Sheet. The particular attention was also drown by the authors on elements of the documentation, characterized by a low percentage (less than 13 %), which data are presented in Table 2.

During the analysis the authors pointed out that the vast majority of this information was not included in the templates described in the literature but there are extremely useful to determine the appropriate method of operation during the process. Actually, some of the data contains general information about the process, such asname of workstation or number of worked shifts.

However, among these elements were also information on the detailed description of the performed tasks (contains valuable information about how to perform specific tasks), duration of expectations time (from the point of view of the process is a waste - necessary to eliminate in the first place during the improving process) or frequency of repeated tasks (information important in ensuring safeand comfortable working conditions). From the point of view of the management it is very important to identify the tasks which add or not the "value". During the performance of value-added tasks (VA) there is a fundamental transformation of the input material (for example: material processing, changing

Table 1 – The identified elements of Standardized Work Sheet

	The elements of documentation	Percentage share element in the documents [%]	
		Literature'sresearch	Enterprice'sresearch
1	Documentname	100	93
2	Enterprise name	100	93
3	Department/Location	100	93
4	Processname	100	67
5	Pre-processname	20	20
6	Next-processname	20	20
7	Workcell	0	7
8	Identification number of the operator	20	7
9	Identification number of work shift	20	0
10	Number of workshift	0	7
11	Team Leadername	40	7
12	Supervisorname	40	0
13	Person who conduct the research	40	33
14	Jigs/ Tools	0	7
15	Part number/ Product name	20	33
16	Units per shift	0	33
17	Takt time	80	73
18	Cycletime	80	47
19	Availableworktime	0	7
20	Standard In-Process Stock	40	20
21	Date of preparingdocument	80	73
22	Number of document's version	60	20
23	Revisions of the document	0	20
24	Date of lastmodification	0	7
25	Person who verify the document	0	7
26	Person responsible for compliance standard	0	33
27	Work/ Operationelements	80	73
28	Description of operation step	0	7
29	Workinstructionscomments	0	27
30	Drawings/Photos of process stages	0	13
31	Othertasks	0	13
32	Manual Time	50	73
33	Machine Time	0	47
34	Walking Time	40	53
35	Waiting Time	0	7
36	Total Time of work	20	33
37	Frequency of task'srepetition	0	7

Table 1 – The identified elements of Standardized Work Sheet

38	Worktimecoursegraph	0	13
39	Workflow diagram	60	73
40	VA and NVA task's division	0	13
41	Value Add Chart	0	7
42	Critical Points	100	73
43	Processimprovementideas	0	7
44	OperatorsLoad Chart	0	13
45	Suggestednumber of operators	0	13

(source: selfstudy)

physical and chemical properties of material or packaging of the finished product), crucial to meet the needs and expectations of the customer. In the process, there are also tasks non-value-added (NVA) of two kinds: the first are necessary to ensure the proper conduct of the process (such as quality control, handling the product or filling in the documentation), the second arean obvious loss or waste (such as waiting for operation of the machine by the employee and long times of transition for workers between tasks performed in a sequence).

The authors pointed out that a relatively large number of elements not present in the templates provided in the literature, but they appear in the document used by the surveyed companies. Some items are not included because of the repetition of the information–the phenomenon described above – such as:

– the required volume of production (convertible with the cycle time),

– the person responsible for compliance with the standard (in most companies, this obligation rests with the Team Leader),

– the name of the workstation (identified with the name of the current process).

However, some elements indicates a high utility in practical use (confirmed by the relatively high rate of over 13 % share), but they are not presented in the existing publications.All elements important for the company and not included in the Standardized Work Sheets included in the literature arepresented in Table 3.

Table 2 – The elements of Standardized Work Sheet with low percentage share

	The elements of documentation	Percentage share element in the documents [%]	
		Literature' sresearch	Enterprice' sresearch
1	Workcell	0	7
2	Identification number of the operator	20	7
3	Number of workshift	0	7
4	Team Leadername	40	7
5	Jigs/ Tools	0	7
6	Availableworktime	0	7
7	Date of lastmodification	0	7
8	Person who verify the document	0	7
9	**Description of operation step**	**0**	**7**
10	Drawings/Photos of process stages	0	13
11	Othertasks	0	13
12	**Waiting Time**	**0**	**7**
13	**Frequency of task'srepetition**	**0**	**7**
14	Worktimecoursegraph	0	13
15	**VA and NVA task's division**	**0**	**13**
16	Value Add Chart	0	7
17	**Processimprovementideas**	**0**	**7**
18	OperatorsLoad Chart	0	13
19	Suggestednumber of operators	0	13

(source: selfstudy)

Table 3 - The elements of Standardized Work Sheet not included in literature

The elements of documentation		Percentage share element in the documents [%]	
		Literature' sresearch	Enterprice' sresearch
1	Availableworktime	0	7
2	Revisions of the dokument	0	20
3	Description of operation step	0	7
4	**Workinstruc-tionscomments**	**0**	**27**
5	Drawings/Photos of process stages	0	13
6	Othertasks	0	13
7	**Machine Time**	**0**	**47**
8	Waiting Time	0	7
9	Frequency of task'srepetition	0	7
10	Worktimecoursegraph	0	13
11	VA and NVA tasks division	0	13
12	Value Add Chart	0	7
13	Processimprovementideas	0	7
14	OperatorsLoad Chart	0	13
15	Suggestednumber of operators	0	13

(source: selfstudy)

The analysis of the results presented in Table 3 shows that there are two elements with high percentage share: the duration of the tasks performed by machine (percentage share at the level of 47 %) and instructions on how to perform the tasks (percentage share at the level of 27%). The subject of further research will be analyze what kind of information carry those elements and why enterprises use this elements in the template, despite the lack of guidance in the literature. Theoretically most of these elements are available in other documents at the workplace, for example in operational instructions or normative of the machine but for some reason enterprises decided to use theme in the documentation of standardized work. The authors can only suppose that this is related totheirhigh utility in the implementation of process improvements. The assumptions will be considered in future research by the authors.

6. CONCLUSIONS

The obtained results show that some elements identified in the Standardized Work Sheetare repeated in both: the templates presented in the literature as well as applied in the company. However, the authors drew a particular attention to the elements that prove the large discrepancies between information included in both sources (literature and enterprises). This situation can be caused by lack of knowledge the employee who create the sheet for the first timeanddo not have a knowledge what kind of elements should be included in the document. However, it may also result from the knowledge and long experience in the application of those document by the employee who knows how to develop the template by new concepts supporting application of standardized work during the years.These considerations will be the subject of further research.

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