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Identifying and prioritizing the indicators of waste elimination in information technology (Case study: the Pasargad Bank of Iran)

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Abstract

In the recent years, most of the companies do not have another choice despite of relying on the information systems due to the complexity or range of their universal activities. In another word, the intangible nature of information technology brings unique challenges for organizations. Also any business process applied by human or machine depends on the quality of information technology. Some of the benefits of the information systems will be neutralize with waste that generated in the information, therefore, identifying these waste in information and implementing lean principles in IT can increase the quality and advantages of the information system. In this research the critical success factors waste elimination in the north branches of Pasargad bank in Iran as one of the well known banks are identified and prioritized by using both the survey and library research method .First, by reviewing the past researches we prepared an comprehensive list of factors of lean IT including the 28 factors and by using the statistical analysis of T-test on the questionnaires distributed between the experts of Pasargad bank 21 critical success factors are identified, then the Analytic Hierarchical Process (AHP) is used to prioritized these key factors. The result show that "deletion of unnecessary complexity and unused potential ","Deletion of extra movement/ transport/ moves", "Lack of error and rehashing "are the three main waste creation.factors in banking industry ,that by removing them we can access to the lean IT systems in a firm.

Keyword: lean IT, criteria prioritizing, waste of information, T_test.

Introduction

In the recent decade , economic environment of the companies have changed seriously .High quality and low cost are assumed as main competitive advantage of the companies and were increasing attention to time and speed. Faster products developing and shorter waiting time in the preparation, production and distribution are the today basic competitive factors[1].

Increasing challenges from global competitors, stimulated many of manufacturing companies to adopt the new production approach and have unique attention to the concept of lean manufacturing[2].

The concept of "Lean" was first used by Womack (1990) to describe the philosophy working methods of Japanese automakers, particularly Toyota production system is capable of developing organization such as quality and service providing to customers by eliminating the waste[3, 4].

On the other hand, developing and explaining the mission, vision and goals of each company /institute become vital and inevitable. In addition appropriate service according to customer needs and long-term value became a strategic and objective decision to access[5].Using IT and its unique principles can increase effectiveness of the systems but it can produce some waste which decreases their efficiency. Applying the rules of the lean paradigm in IT can create a philosophy of using IT without the waste.

The purpose measuring lean IT of organization is gaining better position and the way of achieving long-term objectives. This purpose can be achieved by identifying and prioritizing the waste in IT.

In 2011, Stiven Bell and Michael Orzen published a book, named lean IT in which identifying of efficient factors in creating waste in IT organization and the way of implementing lean principles in IT is reviewed.

Also in 2009, in Netherland, Jan Riezebosetal wrote an article, named Lean Production and Information Technology: Connection or contradiction. In 2007, in England, Christian Hicks published an article called, Lean Information Management: Understanding and Eliminating Waste. In 2009, in Australia, John Pt Mo proposed a paper, named the role of IT usage in production. In 2012, another book by Stiven Bell and other published whose name was Run, Grow, Transform, Integrating Business and Lean IT which studied about the way of performing value in service and attraction and achieving perfection.

Waste creating major and minor indices in the information of Pasargad bank is as fellow:

Table-1
Indexes and Sub-Indexes of waste elimination in IT[6]

Sub index	Main index
Introducing tools and technologies at necessary and not more than required level	Deletion inventory of extra data
Deletion of electronic and old physical or outdated files and messages which should be saved, rejected, and or retrieved	
Improvement of non extended software	
Reduction or omission the oversized inventory of parts	
Hindering entry of the cancelled data in a similar or multiple system (lack of integrated system)	Lack of over-processing in Information technology (IT)
Prevention from searching for data and or the contents which their finding is difficult	
Lack of dataholic, overused email, web searching, social networks etc.	
Lack report production and distribution	
Lack of producing and distribution of document several days before the session, based on which data has been corrected and redistribution and reprinting of side-by-side contents, which are outdated promptly (printing subsidiary contents)	Lack of overproduction (production more/ sooner than customer's need)
Deletion of extra copies	
One-way printing versus two-way printing	Deletion of waiting time/ delay
Lack of unnecessarily searching for data (that usually half an hour or more time of personal time for anyone is allocated to it every day) and delay in receiving, transmission, and saving data	
Deletion of distracters and unnecessary intrusions	
Lack of going to/ coming from printer, copier device, fax machine, and saving archive	
Deletion of postponement between programming and testing it	
Deletion of security barriers against non sensitive dataflow	Deletion of extra movement/ transport/ moves
Lack of using several emails for chat and dialogue when teleconference or vis-à-vis visit is more efficient and sending/ response to emails with not-involved persons	
Deletion of the existing incomplete and false data in the system	
Deletion of the excessive correction and inspection processes of operations	Lack of error and rehashing
Deletion of error caused by inappropriate analysis by operator	
Ergonomic strong design of workstations	
Deletion of over-automation of processes	
Lack of excessive attention to technology and permanently variability of technology	Deletion of unnecessary complexity and unused potential
Asking others and their own personnel for comments	
Lack of investment in training of personnel by organization	
Non updated technological measure	
Development of complex solution for simple problems	

Table1 shows elimination of waste creating indices IT. These criteria resulted from related literature review.

Methodology

Survey method used in this research. In other words to obtain the important index and resolution it and also to obtain pair wise comparisons by experts, the questionnaires has been used. The population in this study consist of the experts of north branch of Pasargad bank in Tehran includes directors, vice presidents and experts of this organization. Also in this research there are used two types of questionnaires as tools to obtain data, that in the next section we will explain each of them. The following figure shows the process of doing ahead research.

According to this chart, after determination factors based on literature, it is turn to determine effective factors in IT waste elimination by using t-test. After obtaining the hierarchical structure problem, the pair wise comparisons are done by experts to form the definite decision matrix.

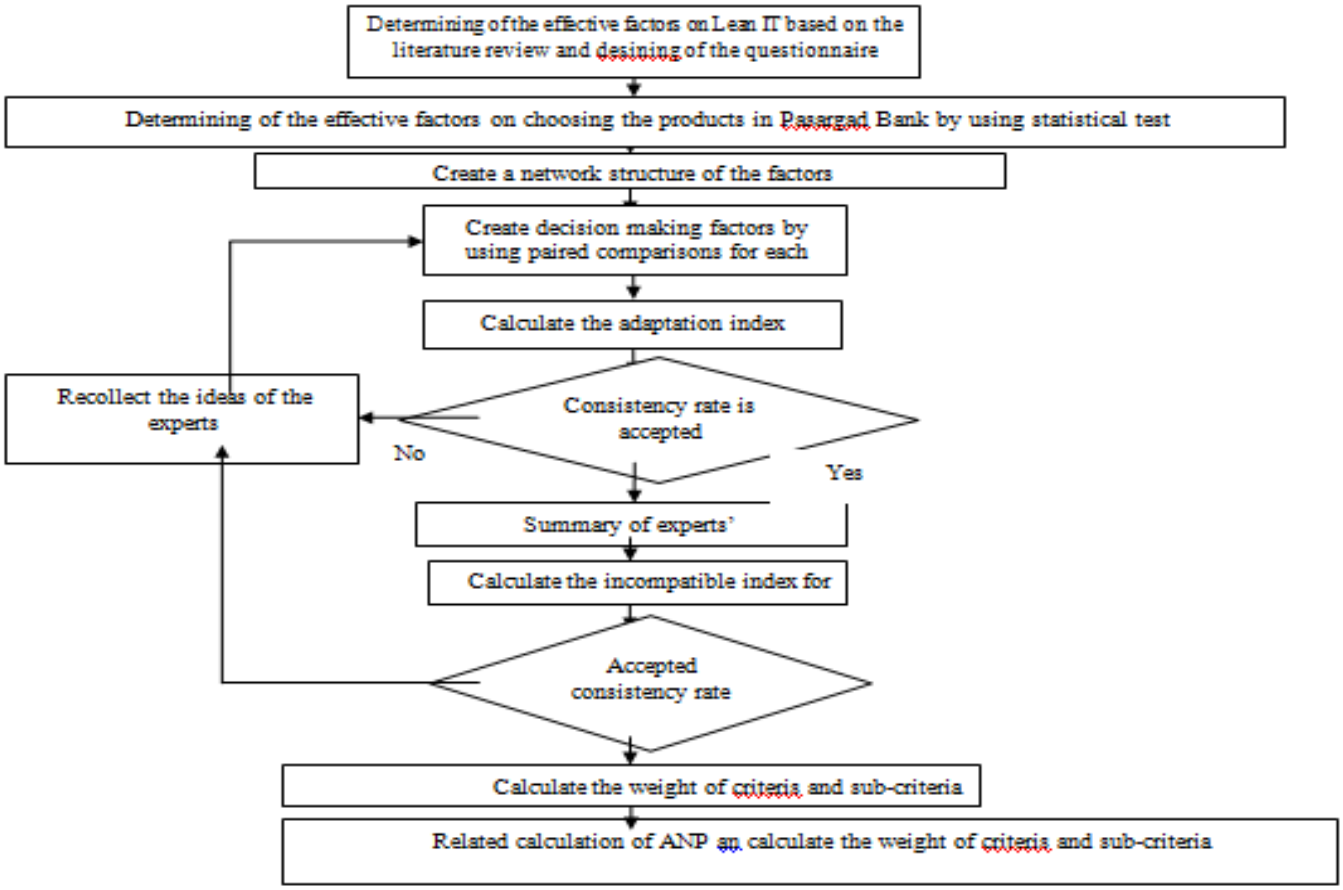

Figure-1
The suggested stage of research methodology

First questionnaire identifying the key factors: The first questionnaire used to examine the impact of identified factors. We should first specify the factors and sub factors which are addressed in literature as critical success factors in IT[7].

This questionnaire structure includes two parts, demographic questions and technical question in the follow detail will explain: i. Demographic questions: in demographic questions tried to obtain total information related to experts 'job experience in Pasargad bank. ii. Technical questions: 35 questions designed to examine the impact of identified criterias. In designing this part we tried that questions would be understandable. To design this part, Likert' 5 scale is used These 5scale are: strongly important, more important, important, somewhat important and the same. These items examine the rate of the factors impact on waste creation in Iranian Pasargad bank.

To measure the validity of first questionnaire, the Chronbach Alpha index is used. Table 2 shows the amount of Chronbach alpha. Field (2009) propose Chronbache`s Alpha over 0/7 to tests that examine abilities of people and presumably this number is also good for attitude questionnaire[8].

Table-2
Rate of first questionnaires validity

Chronbach `s Alpha	Number of alternatives
0.853	38

In this section we consider the first questionnaire result analyzing in other words we evaluate the meaningfulness of each indices and sub-indices of the problem In fact the purpose of distribution questionnaire is investigating of meaningful significant and possibly eliminating insignificant indices. To do this, the experts are asked to express the significance of each noted element with regard to its impact on waste creation in IT in form of the Lirket 5 -scale. The number of questions is 29. The first, second, third, fourth, fifth, sixth and seventh criteria questions are respectively 4,4,3,6,4,3,5 questions. The results of evaluation of each index has been shown in table 3-4 by using SPSS software.. If rate of meaningfulness of (T) test be less than 0.05 (with regard to the level of 95 surety-p value) the null hypothesis can be rejected.

Table-3
Results of analysis on T-test to examine significance level for each index

Variable	Quantity	Mean	Standard deviation	Confidence level for higher than 95%	Statistic-value	Significance level (p-value)	Acceptance or rejection of significance assumption
Deletion of electronic and old physical or outdated files and messages which should be saved, rejected, and or retrieved	31	4.566	0.507	4.747	5.35	1	Accepted
Improvement of non extended software	31	4.2174	0.4217	4.3684	2.47	0.989	Accepted
Reduction or omission the oversized inventory of parts	31	4.391	0.499	4.57	3.76	0.999	Accepted
Introducing tools and technologies at necessary and not more than required level	31	3.435	0.626	3.672	-4.09	0	Rejected
Hindering entry of the cancelled data in a similar or multiple system (lack of integrated system)	31	4.522	0.511	4.705	4.9	1	Accepted
Prevention from searching for data and or the contents which their finding is difficult	31	4.348	0.478	4.522	3.43	0.999	Accepted
Lack of dataholic, overused email, web searching, social networks etc.	31	4.3043	0.4705	4.4782	3.1	0.997	Accepted
Lack report production and distribution	31	3.174	0.177	3.431	-5.53	0	Rejected
Lack of producing and distribution of document several days before the session, based on which data has been corrected and redistribution and reprinting of side-by-side contents, which are outdated promptly (printing subsidiary contents)	31	4.304	0.365	4.532	2.3	0.984	Accepted
One-way printing versus two-way printing	31	2.348	0.487	2.522	-16.27	0	Rejected
Deletion of extra copies	31	4.435	0.507	4.616	4.11	1	Accepted
Lack of unnecessarily searching for data (that usually half an hour or more time of personal time for anyone is allocated to it every day) and delay in receiving, transmission, and saving data	31	4.435	0.507	4.616	4.11	1	Accepted
Deletion of postponement between programming and testing it	31	2.8261	0.3876	2.9649	-14.35	0	Rejected
Deletion of distracters and unnecessary intrusions	31	4.2174	0.4217	4.3684	2.47	0.989	Accepted
Lost documentations	31	3.383	0.617	3.198	-1.55	0.037	Rejected
Lack of using common equipments (sources): waiting time for accessibility of individual plus the needed time for resetting the system and shared application of printer and fax devices	31	4.522	0.511	4.705	4.9	1	Accepted
Lack of going to/ coming from printer, copier device, fax machine, and saving archive	31	4.1739	0.3876	4.3217	2.15	0.979	Accepted
Deletion of security barriers against non sensitive dataflow	31	4.217	0.902	4.54	1.16	0.87	Accepted
Lack of using several emails for chat and dialogue when teleconference or vis-à-vis visit is more efficient and sending/ response to emails with not-involved	31	4.435	0.507	4.616	4.11	1	Accepted

persons							
Ergonomic strong design of workstations	31	3.304	0.765	3.178	1.91	0.015	Rejected
Deletion of the existing incomplete and false data in the system	31	4.391	0.944	4.57	3.76	0.999	Accepted
Deletion of the excessive correction and inspection processes of operations	31	4.391	0.499	4.57	3.76	0.999	Accepted
Deletion of error caused by inappropriate analysis by operator	31	4.087	0.686	4.326	0.62	0.73	Accepted
Deletion of over-automation of processes	31	4.043	0.386	4.272	0.33	0.672	Accepted
Lack of excessive attention to technology and permanently variability of technology	31	4.2609	0.494	4.4216	2.79	0.995	Accepted
Asking others and their own personnel for comments	31	4.13	0.548	4.327	1.14	0.867	Accepted
Lack of investment in training of personnel by organization	31	4.652	0.487	4.827	6.42	1	Accepted
Non updated technological measure	31	3.174	0.576	3.38	-6.88	0	Rejected
Development of complex solution for simple problems	31	2.913	0.515	3.097	-10.13	0	Rejected

After evaluation of sub indices , its turn to examine main indices of the research. To do this the p-value of each criteria and sub criteria is calculated by SPSS software. The results are shown in Table-4.

The result shows that all of the research main indices regarding to being bigger of meaningfulness level, in the above table from meaningfulness of examine (amount 0.05) are accepted. So in the next step the significance of each index and sub-indices can be calculated.

According to obtained information from questionnaires and by using statistical T- test, 7 invalid indices have been recognized and the total number of identified factors after doing statistical calculation which obtained from first questionnaire decreased to 28 indices by SPSS software. The list of chosen final indices is shown in Table5.

Table-4
Results of analysis on T-test to examine significance level for each index

Main index	Quantity	Total Mean	Standard deviation	Confidence level for higher than 95%	Statistic-value	Significance level (p-value)	rejection of significance
Deletion inventory of extra data	4	4.217	0.902	4.54	1.16	0.87	Accepted
Lack of over-processing in Information technology (IT)	4	4.304	0.765	4.578	1.91	0.965	Accepted
Lack of overproduction (production more/ sooner than customer's need)	3	4.391	0.499	4.57	3.76	0.999	Accepted
Deletion of waiting time/ delay	6	4.087	0.668	4.326	0.62	0.73	Accepted
Deletion of extra movement/ transport/ moves	4	4.043	0.638	4.272	0.33	0.627	Accepted
Lack of error and rehashing	3	4.2609	0.449	4.4216	2.79	0.995	Accepted
Deletion of unnecessary complexity and unused potential	5	4.217	0.902	4.54	1.16	0.87	Accepted

Table-5
The key indexes and sub-Indexes of waste elimination in IT 1

Sub index code	Sub index	Index code	Main index
I1	Deletion of electronic and old physical or outdated files and messages which should be saved, rejected, and or retrieved	C1*	Deletion inventory of extra data
I2	Improvement of non extended software		
I3	Reduction or omission the oversized inventory of parts		
I4	Hindering entry of the cancelled data in a similar or multiple system (lack of integrated system)	C2*	Lack of over-processing in Information technology (IT)
I5	Prevention from searching for data and or the contents which their finding is difficult		
I6	Lack of dataholic, overused email, web searching, social networks etc.		
I7	Lack of producing and distribution of document several days before the session, based on which data has been corrected and redistribution and reprinting of side-by-side contents, which are outdated promptly (printing subsidiary contents)	C3*	Lack of overproduction (production more/ sooner than customer's need)
I8	Deletion of extra copies		
I9	Lack of unnecessarily searching for data (that usually half an hour or more time of personal time for anyone is allocated to it every day) and delay in receiving, transmission, and saving data	C4*	Deletion of waiting time/ delay
I10	Deletion of distracters and unnecessary		
I11	Lack of using common equipment(sources): Waiting time for accessibility of individual plus the needed time for re setting the system and shared application of printer and fax device intrusions		
I12	Lack of going to/ coming from printer, copier device, fax machine, and saving archive		
I13	Deletion of security barriers against non sensitive dataflow	C5*	Deletion of extra movement/ transport/ moves
I14	Lack of using several emails for chat and dialogue when teleconference or vis-à-vis visit is more efficient and sending/ response to emails with not-involved persons		
I15	Deletion of the existing incomplete and false data in the system		
I16	Deletion of the excessive correction and inspection processes of operations	C6*	Lack of error and rehashing
I17	Deletion of error caused by inappropriate analysis by operator		
I18	Deletion of over-automation of processes		
I19	Lack of excessive attention to technology and permanently variability of technology	C7*	Deletion of unnecessary complexity and unused potential
I20	Asking others and their own personnel for comments		
I21	Lack of investment in training of personnel by organization		

The questionnaire of the hierarchical analysis process: In this paper the main factors elimination of waste of IT in the Pasargad bank of Iran are prioritized by Analytic Hierarchical Process method (AHP).AHP introduced by Saaty[9]. When act of decision making facing with multiple competing options and decision making criteria it can be used. Introduced criteria can be both quantitative and qualitative. The base of this decision making method is in the pair wise comparisons. Decision maker begins to provide a hierarchical tree. Hierarchical decision tree shows the comparison factors and evaluation of competing options in decision. Then a series of paired comparisons carries out. This comparison shows the weight of each factor in evaluating competing alternatives. Finally logic of AHP

combines the matrices that resulted in pair wise comparisons in a way that optimized result could be achieved.

Thomas Saaty (founder of the method) AHP principle stated the following four principles as principles of AHP and founded all calculations, rules on this principles. These principles are: i. Reverse condition: If the preference of A element to B element be equal to n, preferences of B element to A element will be equal. ii. The principle of Homogeneity: The element A should be comparable with B element. in other words the preference of A element on B element cannot be infinite or zero. iii. Dependence: Each hierarchical element can be dependence to its higher-level element and this dependence can be continuing to the highest level linearly. iv. Expectations: When changes occur in the hierarchy structure the evaluation process should be done again 10.
AHP model using of this method involves four major steps includes:

Modeling in this step, problems and decisions objects are as a hierarchy of decision elements which are connected together. Decision elements include a "decision index" and "decision choices". AHP requires breaking the problem into a number of hierarchical levels. The high level represents the main goal of decision making. The second level represent a key factor "that may later be broken in more detailed sub-indices" Final level represents decision alternatives .in the following figure hierarchy of a decision problem is shown[10].

Preference judging: making comparison between different decision alternatives, based on each index and judgments about the importance of decision index by performing pair wise comparisons. After designing of decision problem hierarchy, the decision maker must create set of matrices that measure importance or relative preference of indices respect to each alternative with regard to indices with respect to other alternatives .This is done by making pair wise comparisons between decision element (paired comparison) and by assigning numerical scores that indicates preference or importance between two decision element. Usually comparing alternatives with I_{th} indices respect to other alternatives or j_{th} indices are done to do this, that in the below the method of valuation indices respect to each other has been shown .Valuation of indices respect to each other preferred value estate of comparison I respect to j explaining 1 have equal alternatives importance or I indices respect to j have equal importance or do not have preference to each other. Grade 3 means rather important alternative or I index respect to j is a little important Grade 5 means important alternative or I index is important respect to j. Grade 7 means the most important alternative or index is important than j and is not comparable with j. Grades 2.and 2,4,8 shows the intermediate values between preferred values , for example 8 is more important than 7 and less important than 9 for I./

Calculation of the relative weights and determining weight of "decision elements" to one another through a series of numerical calculations.

The next step in AHP is doing necessary calculations to determine the priority of each decision element using the information of pair wise comparisons matrices. Summaries of mathematical operations in this level are as the following. We calculate total number in each column of the pair wise comparison matrix and then divide each element of column to the total number of that column. The new matrix that is obtained in this way called "normalized comparison matrix". We calculate the mean of normalized comparison matrix number in each row. These relative weights mean presents decision element with matrix rows.

Integration of relative weights in order to rank decision alternatives. In this level we should multiple relative weight of each element to the weight of higher element to obtain the final weight. By doing this step for each alternative the final weight is obtained. Consistency in judgments almost all calculations related to AHP carries out on base of preliminary judge of decision maker in the form of pair wise comparisons matrix. And any error inconsistencies in the comparison and determine the value between alternatives and indices will damage the final result. Inconsistency rate that in the follow we will be familiar with it is a tool that specify inconsistency and indicates how much we can trust to the priorities that resulted in comparisons .for example if A element be important than B (preferred value5) and B be rather important than C (preferred value 3) therefore we should expect that A evaluated more important to C (prefers value 7 or more) or if preferred value of A to B ,2 and B to C , are 3 <then the value of A to C should present preferred value 4 . Maybe the comparison of two alternative is simple but when the numbers of comparisons increases we cannot trust the comparisons compatibility easily, this trust must be achieved by applying the consistency rate . Experience showed that if incompatibilities rate be less than 0.10 consistencies of comparisons are acceptable otherwise the comparisons should be revised. The following steps is used to calculate inconsistency rates: step1.Calculate weighted sum vector: multiple pair wise comparisons matrix in column vector " relative weight" call the new vector that you got by this way weighted sum vector.step2.Calculate the consistency vector: Divide the weighted sum vector element in relative priority vector. The resulting vector is called consistency vector.step3.calculate vector elements mean λ max which gives λ.step4. Consistency index calculation: Consistency index defined as follow the rate of consistency results from dividing consistency index per random index[11].

The second questionnaire also has both demographic and technical questions. The questionnaire structure explained in the follow: i. Demographic questions: in demographic questions tried to collect total and demographic information in relation with responders. This section includes 1 question: the rate of

responders 'job experience. ii. Technical questions: after preparing final list of effective criteria's we classified factors. To design this section with inspiration of Likert's5- scale, used of similar 5 items scale that its 5 items are: strongly important, very important, important, somewhat important and same. This item examines the rate of identified criteria effects on waste creation in Pasargad bank respect to each other. By using the Kokrane sampling method, questionnaire distributed between 35 company experts and between them 3 questionnaires was invalid. So 32 questionnaires collected from these 32 questionnaires, 2 questionnaires send back to answer again because they were incompatible .From those 2 questionnaires 1 of them do not answered because interviewer did not cooperate and just we resaved 1 questionnaire among them. In final 31 valid and compatible questionnaires collected that their demographic data showed in below table. iii. Before distribution of questionnaires and collecting the opinions, the questionnaires were distributed between the group members of experts to examine the accuracy. This group is consisted of:

Two professors, three directors and three experts that have been working in banking area aver 5 years. The purpose of accreditation is to insure of clarity, accuracy and being meaningful of questionnaire items for responders. In this level by the purpose of experimental research, It is asked the participants to answer to the questionnaires in presence of researcher and after detailed study of the questionnaire the way to answering and the table that indicates the indices, and tell the researcher their opinion.

The purpose of this phase of research is prioritization of indices .So it is necessary that responders have enough experience in banking with regard to this the Tehran branches of Pasargad Bank . To choose statistical population used of opinion of 31 experts from different part of banks who had enough knowledge and experience in using IT.

Using AHP for prioritizing waste factors in IT of Pasargad Bank: In this part, we focus on presenting data and collected information. The purpose of this section is presenting data and research collected information and analyzing them. As mentioned before, by using the obtained results from previous studies and also opinion of experts, the effective factors in indices evaluation problem and effective factors in waste creation in Pasargad Bank and then a model from evaluating problem in expert choice software is drawn. This model includes main criteria and sub criteria that each main index with its sub-indices has been shown in figure3. To obtain the relation between problem main indices used of previous studies and experts 'opinions.

Obtaining the weights: In the AHP model the purpose placed in the first row, main criteria in the second row and sub criteria in the third row. Pair wise comparison matrices creating for determine criteria's weight. After normalization criteria and forming pair wise comparison matrices, the final weight of criteria will be determine.

Table 6 that shows the main indices weight and with regarding to obtained results, the most important index are non error and reworking and second one is "removing the unnecessary complexity"

After reorganization of effective factors on waste creation in IT (that prepared from analyzing obtained data from questionnaires), second questionnaire used to evaluation relative impact of recognized factors." Deletion of unnecessary complexity and unused potential, less important index is related to "Deletion inventory of extra data".

Table-6
Weights of the indexes through AHP

Final rank	Rank in branch	Weight of the main index	Symbol	Main index	Row	Index
7	7	0.0443	C1	Deletion inventory of extra data	1	Index
6	6	0.0607	C2	Lack of over-processing in Information technology (IT)	2	
5	5	0.0661	C3	Lack of overproduction (production more/ sooner than customer's need)	3	
4	5	0.1091	C4	Deletion of waiting time/ delay	4	
3	3	0.1754	C5	Deletion of extra movement/ transport/ moves	5	
2	2	0.3194	C6	Lack of error and rehashing	6	
1	1	0.225	C7	Deletion of unnecessary complexity and unused potential	7	

Table-7
weights of the sub- indexes through AHP

Final rank	Rank in batch	Weight of sub-Index	Sub-Index	Symbol\	Index
10	3	0.0101004	Deletion of electronic and old physical or outdated files and messages which should be saved, rejected, and or retrieved	l1	
8	2	0.01505314	Improvement of non extended software	l2	
13	1	0.01914646	Reduction or omission the oversized inventory of parts	l3	
17	3	0.00718081	Hindering entry of the cancelled data in a similar or multiple system (lack of integrated system)	l4	Sub-Index
12	2	0.01730557	Prevention from searching for data and or the contents which their finding is difficult	l5	
2	1	0.03621362	Lack of dataholic, overused email, web searching, social networks etc.	l6	
4	1	0.03422658	Lack of producing and distribution of document several days before the session, based on which data has been corrected and redistribution and reprinting of side-by-side contents, which are outdated promptly (printing subsidiary contents)	l7	
6	2	0.03187342	Deletion of extra copies	l8	
14	4	0.0237838	Lack of unnecessarily searching for data (that usually half an hour or more time of personal time for anyone is allocated to it every day) and delay in receiving, transmission, and saving data	l9	
7	1	0.04737122	Deletion of distracters and unnecessary intrusions	l10	
9	2	0.03795589	Lack of using common equipments (sources): waiting time for accessibility of individual plus the needed time for resetting the system and shared application of printer and fax devices	l11	
15	3	0.02895854	Lack of going to/ coming from printer, copier device, fax machine, and saving archive Deletion of distracters and unnecessary intrusions	l12	
11	2	0.0566542	Deletion of security barriers against non sensitive dataflow	l13	
5	1	0.08978726	Lack of using several emails for chat and dialogue when teleconference or vis-à-vis visit is more efficient and sending/ response to emails with not-involved persons	l14	
19	3	0.0546174	Deletion of the existing incomplete and false data in the system	l15	
18	2	0.0626024	Deletion of the excessive correction and inspection processes of operations	l16	
1	1	0.2021802	Deletion of error caused by inappropriate analysis by operator	l17	
21	3	0.0228375	Deletion of over-automation of processes	l18	
20	3	0.02763	Lack of excessive attention to technology and permanently variability of technology	l19	
16	2	0.047205	Asking others and their own personnel for comments	l20	
3	1	0.1273275	Lack of investment in training of personnel by organization	l21	

You can see in Table 7 the most important sub-indices are: Deletion of error caused by inappropriate analysis by operator, Lack of dataholic, overused email, web searching, social networks etc. Lack of investment in training of personnel by organization.

Conclusion

Necessity of effective management system is a long term development that has priority for the company's success. In the area of lean thinking, management focus, create sustainable processes and standardized works that continuously makes values to the customer. Qualified and effective information technology and systems for the success of the company are essential.

An effective lean management system should be supported by qualitative information. Lean IT is the result of collaborative process of problem solving that directed through strategic objectives.

Lean IT commits personal to using a frame work of principles, systems and leanness philosophy in the company based on IT to provide quality information and effective information system enabling innovation and continuous process improvement. In this research after reorganizing the effective factors and criteria on waste elimination of IT in a desired bank through literature and experts' opinion, prioritizing the factors are done by pair wise comparisons between criteria on base of inner relationship through questionnaire and giving weight to criteria by using AHP method. The most important criteria were respectively "Deletion of unnecessary complexity and unused potential, Deletion of extra movement/ transport/ moves, Lack of error and rehashing. In theses mentioned indices respectively the most important error caused by inappropriate analysis by operators (uncompleted sentences). usually analysis is the most important section of the software product Inappropriate analysis causes that final product is not be relevant to needs of consumer so causes a great of wasting in their time and the second important factor is " lack of dataholic, overused email, web searching, social networks and etc. Useless web surfing will cause new useless in formation creation that if we multiple amount of them to the number of persons who are doing this, there will be a great amount of useless information that will occupy many sources. The third factor is "Lack of investment in training of personnel by organization ".Unquestionably training people to use every new system is as much as important that how the system is written. The inability of using system by people due to the lack of training does the same amount of dissatisfaction that the system itself is invalid.

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