

IMPLEMENTATION OF QUALITATIVE RULES IN COMPANY'S INFORMATION MANAGEMENT

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Abstract:

In the article there were presented chosen issues of quality management. Important role of information and work processes in companies were emphasized. Based on eight rules of quality management, TQM standards and ideas of discipline pioneers like Deming, Juran, Crosby and Shewart, author has constructed way of using chosen rules and assumptions to company's information circulation. Analogy, suggested by author, has not only emphasized importance of information as a company's resource, but also has pointed to possibility of improving ways of managing this information.

Key words: rules of quality management, information circulation, Total Quality Management

INTRODUCTION

Every company has to be treated as an open system, which remains in constant relation with its surroundings. System analysis defines organization as a "system of interdependent variables" [1]. So there is exchange of matter, energy and of course information. According to the fact, that main target for every company is getting enough profit for its to stay and keep a good market position, it's not always enough to implement an ISO 9000 series regulations and integrated or business systems.

Without regulating, and real governing of information in company there can be no process improvement. So, it is a crucial assumption that for a good flow of information, a company needs to use the same rules of quality managing as for production and services processes. Among these kind of rules there can be some of a "14 Deming's points", eight rules of quality management or other quality management concepts.

RULES OF QUALITY MANAGEMENT FOR INFORMATION

Usage of "eight rules of quality management" for information's circulation in company means focusing mainly on customers, informing about process and product, processing, creating and updating information. It is very important to know who is really a client in a particular work process. Without this, and knowledge about client's expectations there can be no impact on work process quality, so there can be no improvement of it. It is vital to know:

- customer purpose and
- employees inner knowledge.

The first case regards to companies and organizational units. They not only have to provide products and services to their customers, inner or outer, but also all the information about it. It can be accomplished with catalogues, advertisements, internet, correspondence or meetings. It applies also to outer company's shareholders, who wants

to know latest information about their business or competition, and to employees, who wants assurance that their work is compliant with company's assumptions.

The second case regards to every employee, who is doing a task [10] which require a necessary information. That makes the employee an information's client.

Information's quality involves not only a client, but also a supplier. Because of that we can talk about information's delivery chain. In logistics idea of delivery chain is defined as a structure of organizations group accomplishing common actions to satisfy demand on certain products in whole goods flow chain, from getting material to delivery product. Regarding to information's delivery chain [6], a client is an employee, who uses output data and processes them for his own utility. A supplier, and often a creator of information, is a person who cause a creation and update of component data. According to V. G. Narayanan and Ananth Raman the effectiveness of the chain depends on accordance of targets and motivation of all of the participants, because risk factors, costs and benefits from common act are evenly distributed [15]. That is why everybody should agree with Christopcher, who says that delivery chain is like a web of connections and correlative organizations. They are co-operating, controlling and improving material circulation and information's flow from supplier to users [4, 5]. Regarding to information this concept should be treated similar. Information would be a product, circulating in information's channel from sender – manufacturer to receiver – customer.

In "information's delivery chain" it is important to distinguish current information's producer from its middleman, who receive information in one form and change it to another adding minimal value. Currently fundamental, weak point, in defining process is that most processes is determined by physical and touchable production. Infor-

mation about product are treated like a by-product, "real work" documentation or just a "paper work".

This way of seeing processes is changing because information society, that we are part of, is starting to realize how important information is for current ventures and those innovative future ones. In subject literature sometimes can be spotted an "information web" term which is similar to delivery chain [8].

Information's quality requires a careful planning and control. Planning is connected to stating which information is required to efficiently accomplish work processes. This approach is used not only for planning information and its flows, but also for whole systems and databases, within which information is created, passed on and stored. It's not only about information in computer databases but also about current information's circulation in economic systems.

Nowadays originators of are key factor to information's quality. They must be engaged in defining information both automated and not automated. Identification or even definition of data is compliant and agreed by pursuer and receiver of information. Manufacturers must know their clients and their needs. It is also important to, know their informers and troubles that can occur in gaining crucial information. Through engagement of both employee groups at once there can be created a co-operating group rather than competition.

Information's intermediaries are also include in the information's flow process. They are employees, which role is convert information from one form to another, for example someone who inputs paper stored information to a database. Databases should be treated as a part of computer system. Other parts of that system are: technical hardware, software, communication technologies, people, information and organization – part of organization system with rules and regulations [14]. Because information's intermediaries are not creating information, they may not be able to track down and correct potential mistakes. As a result of that information can be distorted and require update with proper data.

Badly qualified or even wrongly recorded information leads to a need of identifying it again, granting it a proper status and updating it. All these actions authenticate information and allow getting to proper and right source data. Process and system approach also refers to information. In the first case it refers to process of creation, or simply production of information, in the second one to structure of functionality and implementation processes connected to generating, gathering and sharing information.

As Łobejko pinpoints, information system is a semiotic system. Information's technology, computer methods and organization of information's processes are just tools to accomplish process in social-economical systems. These tools have an important affect on quality features of information systems and on information itself. Remembering that information's technology is not a solution and only a tool to accomplish acquired targets and just as any tool it can be used in a effective or ineffective way [14].

Kisielnicki and Sroka have termed company's information system by assigning specified elements [9]:

$$SI = \{P, I, T, O, M, R\} \quad (1)$$

where:

P – collection of objects, who are users of the system,

I – collection of information about condition and changes that are happening in the company; information's resources,

T – collection of technical tools used in processes of collecting, sending, processing, storing and disposing information,

O – set of system's solutions, used in relevant organization,

M – metadata, otherwise information system's description and its information's resource,

R – relations between certain sets.

As mentioned in above collation, processes that expose information as a part of information system, should be processed with every employee involved. Not only process owners, computer scientists, personnel employees. Directors and Managers should try improving ways of communication by for example creating intranet communication channels or whole computer systems prepared for needs of potential inner client.

CHOSEN DEMING'S INFORMATION POSTULATES

From 14 Deming's postulates in relation to managing information special attention should be paid on some of them:

- constantly improve system processes of production and services (point 5),
- execute trainings (point 6),
- settle modern methods of managing to help employees work better (point 7),
- get rid of fear atmosphere and encourage mutual communication (point 8),
- get rid of barriers between departments, so they can co-operate better (point 9) [18].

Point five in Deming's postulates has big influence on every company's information system. On how it's planned, configured and how it is working. And what is most important, does it satisfying client's expectations. Moreover, improving circulation of information in company should be executed in a continuous way, but with personalized to client needs intensity.

Continuous improving includes also every representative of a company, starting with managers and directors and ending with line workers and helping services. They possess some resources of data, information and knowledge that on adequate time should be used, supplemented and conclusion should be generated that leads to self-improvement and improvement of work processes.

Improving quality of information it is also getting rid of unnecessary, obsolete data and out of date information. Information's quality improving actions need engagement from organization's all employees. Those actions can be based upon:

- innovations in product's information and information handling and also developing information, they don't possess;
- Innovations in process, from which data come. Elimination direct reading of process parameters by employees. It can be achieved by using industrial automation;
- Improving existing data. Correcting wrong information or completing missing data, makes them useful for line workers but also for workers operating data bases or information storages;

Improving existing process by analyzing disadvantages and their reasons.

Preventing defects eliminates costs caused by broken data, just as costs of repairing it and making it useful again. Cost of data correction can be 5 or even 10 times higher than cost of defect prevention.

Quality's improvement process is continuous. Employees actions, behavior and attitude are part of that process. Those elements accomplish assumptions of improving quality of information for all clients, both inner and outer.

Summarizing deliberations until now it is worth to show in a clearer view actions connected to improving information's quality. Elements and stages of that process are:

1. Stating costs, value of information chain for data gathering, referring to client or order. That identifies all processes, which can create or improve data and those who use that data.
2. Identification of information's producer and process owner.
3. Knowing employees knowledge and lower process owners.
4. Analyzing changes and resources which had impact on irregularity of information. Identifying categories of data defects based on economical aspects.
5. Setting plan of improvements and their implementation in proper company's environment. If it is necessary, specialist from other companies or departments should be asked for help.
6. Monitoring process of information's improvement during implementation of chosen actions, to see if they can accomplish desired targets on proper level.

Point 6 refers to bringing in trainings in information's quality.

This issue is so important, that it is not one but two out of 14 indications of TQM forerunner (Total Quality Management). It refers to well known truth: when somebody has to know how to do something right, he has to be properly trained.

Point 13 stands by constant need for training and spreads also to improvement of quality by innovations. Considering that in modern times information is the most miscellaneous resource in organization, it is important to remember that the biggest acquisition for company are and always will be people. With skilled, educated, authorized and quipped with high quality current information personnel, a company will grow. Unfortunately as it often happens, that potential is wasted, because personnel and their abilities, information, knowledge and capacity are not well handled [11].

The message in point six is simple. People can do their work well, they have to know how it is supposed to be done. They have to be educated why high quality is expected and how to achieve that. Deming says clear, that training is needed not only for subordinate employees but also for management team so they can know all work processes and understand company's value chain.

Without training whole series of questions appear. How data producers can provide high quality information, when they are not properly trained? How science employees can use that data in adequate way if they do not know its meaning? How data analyst and system analyst can develop information's quality models, data definitions and good quality usage when they are not properly trained?

Summarizing deliberations until now it can be said, that every employee in company needs a training for rules of managing and usage of information. Life cycle of information begins with identifying potential information from

parts of data in users interests area. Gathered important data is a source for information. Furthermore there are some necessary steps needed to convert that source into resource. Those steps are: after verification of information source, finding mechanisms of physical and intellectual access, providing possibility of data storage – resource of information is serving users needs in this area. Resource can have a active or passive status. It is passive when it is used from users initiative. On the other hand it is active when information regularly get to user in a form of reports, collations and current projects. It means that it can be treated as a active user information resource. Following information's life cycle model proposed by K. Lewitan it should be considered that information not always refers to relevant physical object, because information itself is a mental idea given in a communicate.

It is advised in information's life cycle to:

- analyze effects of training by observing lately trained personnel,
- improve trainings when needed,
- execute training and continue improving them [12].

In seventh quality point [7] Deming puts tension to management and managers influence on improving processes quality. He suggests to establish a fresh leadership, which would not only supervise employees during their work, but mainly commanding a process of improvement. Information should not only be supervised but it also should be managed with well known concepts, methods and tools. Managing teams can also be created. They would be analyzing work process through flowing information, also evaluating efficiency of information's management in performed actions, both planned and improved.

According to Deming everyone can work effectively for company and just as much effectively support information exchange between company's different organization levels.

Point eight explains why data producers cannot fully engage into tasks given to them. Lack of safety, fear and anxiety are disadvantageous feelings that they have. Expected information's quality will never be achieved if data producers would be afraid of making mistakes, and wouldn't feel free to show problems and suggest improvement of producing process. Fear sabotages information's quality. In a workplace it leads to stagnation in actions and lack of innovation a productivity. That is why point eight requires from managers to eliminate source of fear, by for example open communication. These actions allow data and information producers to develop their potential and improving information's circulation in work process.

The last from important points, nine, says about removing barriers and obstacles in co-operation between company's departments. Employees which are responsible for researches, projecting, production and selling should work as a team, who efficiently can solve problems with production process, fabrication and services. This team should plan information's circulation in company, and correct it when needed. Knowledge that information's producers, information's clients and also employees as a team possess is way bigger that every department separately. It gives not only wider perspective for work process implementation, but mostly it gives a full picture of information's flow, like time and place in information's life cycle. It is also necessary for improving information's flow and process that it is a part of.

Level of engagement in implementation of Deming's advices can be shown graphically with radar graphs, pic-

tures 1. and 2. Nodes on graphs represent consecutive Deming's postulates: point 5, point 6, point 7, point 8, point 9. Level of fulfilling Deming's advices is represented in 5 points scale. Shown below profiles can be treated as a exemplary phases of organization's engagement in accomplishing Deming's advices for information's quality.

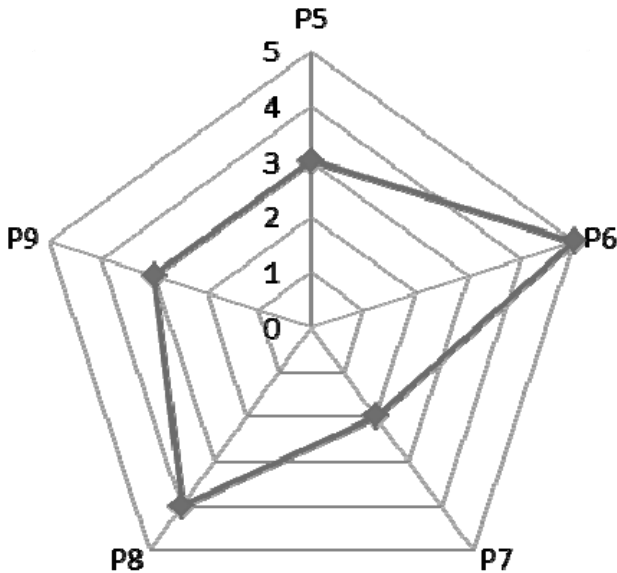


Fig. 1. Profile of fulfilling requirements of chosen Deming's indications for information circulation, 1st phase

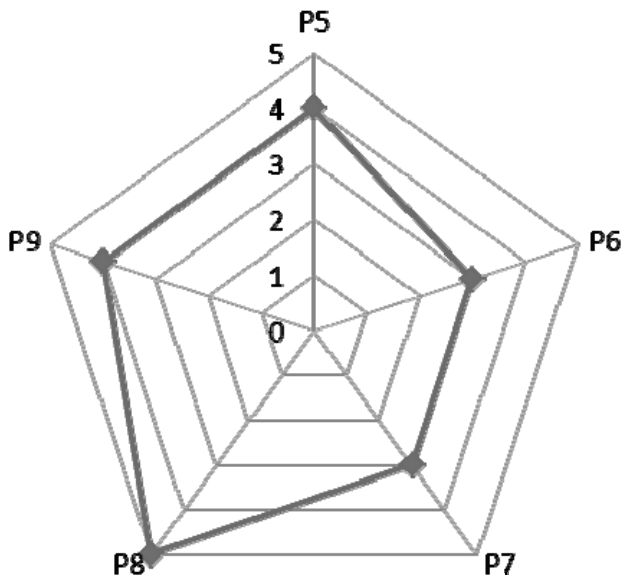


Fig. 2. Profile of fulfilling requirements of chosen Deming's indications for information circulation, 2nd phase

Radar graphs are excellent for comparing ratings, feelings and values. They allow for evaluation of couple attributes at once, when every attribute has its own numeric axis. That way a needed profile can be specified, for example a profile concerning quality and improvement of information in company. Profiles can change dynamically, depending on:

- taken actions and production initiatives by company,
- fluctuation of employees,
- state of advanced computer's technology in company.

Beside of that they can be used as a tool to visualize state that company is in the moment, and a state that it would like to be with for example number of produced goods, services served or effectiveness of information's flow. They give possibility to compare level of quality management in changing company's situation both inside and outside.

OTHER CONCEPTS OF MANAGING INFORMATION'S QUALITY

Similar to Deming [3], Juran [13] has posited, that quality of final product depends on proceeding of process implementation. A special attention should be paid on process planning, designing, organizing and choosing of process's checkpoints. Thorough qualitative and quantitative analysis of process was supposed to help finding sources of its instability. So called Juran's "process's trilogy" includes quality planning, quality control and improvement of process's quality. In case of planning, that process according to Juran, should be about such a development of studied production process, that a target would be acquired – needed level of quality.

So planning should refer to:

- inner and outer client,
- client's needs,
- perspectives of product's development and product's production processes.

Philip B. Crosby, opposite to Deming and Juran, believed in perfection of execution and work without defects. Crosby is a creator of "zero defects" concept. It's so different than commonly accepted quality level, which assume 95-98 percent of correct deliveries. According to Kanusuke Matsushita, chairman of Matsushita Corporation, who is applying "zero defects idea": "it is better to pursue perfectness and not achieve it, than to pursue imperfectness and achieve it" [16]. Crosby's concept, highly appreciated by Japanese, points on necessity and worthwhileness of investments in quality improvement. It is also an integral part of four absolutes of Crosby's quality philosophy [13]:

1. Quality is termed as a conformity with specification, not as a perfection in execution.
2. Quality system's target is to prevent problems, that means that it should be concentrated on eliminating reasons of mistakes, and not on controlling and eliminating follow-ups.
3. Achieving quality standard through "zero failures" means that the only acceptable level of quality is "zero defects". Every excess above "zero" needs repairing actions to be taken.
4. Measure of quality depends on price is paid for non-conformity.

Last concept of improvement is Shewhart cycle. It consist of four stages: plan, do, check, act. Because of its simplicity it is very useful in improving work processes, including information processes. Even it is widely used by Deming to perfecting production processes, it also very well adopts to processes of information's creation, manipulation and disposal. Simple example for that are documents and records supervised in documented quality systems [19].

CONCLUSION

Nowadays information is a distinctive resource in a company. But it is not perceived as other resources and nobody know its importance. They are not appreciating it when it is and not calculate costs when there is a lack of

it. But even half century ago J. Senn wrote that we enter a "information century", more precisely a century of information systems [17]. Currently more often can be spotted a web society term, which refers to commonly used telecommunication technologies, and also growing range of Internet. Mentioned global alterations affects either locally, within company. Every aspect of its functioning depends on ways of information's management, because every company is also a information system.

That is why when quality attitude, rules and indications are known and earned they should be applied also to information processes. These kind of actions will bring traders closer to achieving not only assumed and close targets, but also those further away. So it is indispensable to:

- focus on information product's client. On his demands and expectancies. Be ready that client, who we are serving, communicating with him using information and sharing with him our expert knowledge can demand additional information to operate those adequate, desired by him,
- adopt system of continuous processes improvement, which creates, updates and presents information to eliminate costs of low quality information. It will improve accomplishments and results of work processes,
- employ proven, scientific methods to measure and enlarge satisfaction and contentment of client, both inner and outer.

REFERENCES

- [1] Bertalanffy L.: Ogólna teoria systemów. Podstawy, rozwój, zastosowania. PWN. Warszawa 1984.
- [2] Borys T., Rogala P.: Philip Barnard Crosby. Problemy jakości. Nr 9, 2002, s. 4-5.
- [3] Borys T., Rogala P.: William Edwards Deming. Problemy jakości. Nr 7, 2002, s. 8-9.
- [4] Christopher M.: Logistyka i zarządzanie łańcuchem dostaw. PCDL, Warszawa 2000.
- [5] Fechner I.: Zarządzanie łańcuchem dostaw. Wyższa Szkoła Logistyki. Poznań 2007.
- [6] Fertsch M. (red.): Słownik terminologii logistycznej. ILiM. Poznań 2006.
- [7] Flood R. L.: Beyond TQM. J. Wiley, R. Sons. New York 1993.
- [8] Goban-Klas T.: Cywilizacja medialna. Narodziny nowego społeczeństwa, [w:] Haber L.H., Niezgoda M. (red.): Społeczeństwo informacyjne. Aspekty funkcjonalne i dysfunkcjonalne. Wydawnictwo Uniwersytetu Jagiellońskiego. Kraków 2006.
- [9] Kisielnicki J., Sroka H.: Systemy informacyjne biznesu. Agencja Wydawnicza Placet. Warszawa 1999.
- [10] Kotarbiński T.: Traktat o dobrej robocie. Wydawnictwo Zakład Narodowy Imienia Ossolińskich. Wrocław-Warszawa-Kraków-Gdańsk 1975 (wyd. 6).
- [11] Latzko W. J., Saunders D. M.: Cztery dni z dr. Demingiem. Nowoczesna teoria zarządzania. WNT. Warszawa 1998.
- [12] Levitan K.B., Information Resources as Goods in the Life Cycle of Information Production. Journal of the American Society for Information Science. Nr 33, 1982.
- [13] Lindsay W. M., Petrick J. A.: Total Quality and Organization Development. St. Lucie Press Boca Raton. Florida 2000.
- [14] Łobejko S.: Systemy informacyjne w zarządzaniu wiedzą i innowacją w przedsiębiorstwie. Oficyna wydawnicza SGH. Warszawa 2005.
- [15] Narayanan V. G., Raman A.: Efektywność łańcucha dostaw: kluczem może być zgodność celów i bodźców jego uczestników [w:] Zarządzanie łańcuchem dostaw. HELION. Gliwice 2007.
- [16] Pike J, Barnes R.: TQM in Action. London 1996.
- [17] Senn J.: Information Technology in Business. Prentice Hall Englewood Cliffs, NJ 1995.
- [18] Szczepańska K.: Kompleksowe zarządzanie jakością TQM. Wyd. Normalizacyjne ALFA-WERO. Warszawa 1998.
- [19] Kijowski J., Sikora T. (red.): Zarządzanie jakością i bezpieczeństwem żywności, integracja i informatyzacja systemów. Wydawnictwo Naukowo-Techniczne. Warszawa 2003.

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