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THE USE OF MALCOLM BALDRIGE IN DIFFERENT TYPES OF COMPANIES: A SYSTEMATIC MAPPING STUDY

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ABSTRACT

There are many aspects to improve company performance through quality management of the products/services offered. One method that can be used in performance measurement is Malcolm Baldrige. The widespread use of Malcolm Baldrige in various types of companies, it is important to carry out mapping to find out the locus, focus, and type of research method that is dominantly used from previous studies. This research is expected to provide an overview in the form of a research map related to the use of Malcolm Baldrige in various types of companies. The research method used is a systematic mapping study using the Scopus database on the topic of using Malcolm Baldrige in various types of companies. The results and findings of the study show that there are 38 relevant articles regarding the use of Malcolm Baldrige in various types of companies. The highest dominance of the locus of research carried out is in manufacturing and service companies simultaneously, and then the focus that is widely studied is the application of quality management. The conclusion of this study is that a research map is obtained to be used as research development in the future; the implications found are that there are still gaps that can be used as opportunities for renewal in subsequent researches.

KEY WORDS

Systematic mapping study, Malcolm Baldrige, performance, quality.

The modern business era causes all companies to be able to compete, and are required to always innovate and improve at all times and sectors in the company (Putri, Taroepratjeka and Harsono, 2015). In order for the company to be able to compete or compete, it is necessary to measure performance, in making improvements to aspects that need to be improved (Nirwan, Arijanto and Nugraha, 2015). Apart from measuring the performance of excellence in company quality management, it is one of the shortcuts in building a company that is productive, highly competitive, and oriented towards long-term plans (Indriya, 2018). Performance improvement based on product/service quality management to achieve excellence, discussed in a concept, namely Total Quality Management (TQM) (Gaspersz, 2005). In TQM there are several derivative methods that can encourage the quality management of the company such as Lean Six Sigma, Six Sigma, Malcolm Baldrige, Fishbone and Statistical Quality Control (SQC) (Ananda, Arifianti and Wulan Tresna, 2018). Performance measurement can be done using the Malcolm Baldrige method, the method is appropriately used to analyze the performance of a company both manufacturing / services, because an assessment using Malcolm Baldrige can be useful for studying financial and non-financial performance (Denis, 2006).

Malcolm Baldrige's method has seven criteria that can be developed with various aspects, to find out the company's performance in achieving its best quality for customers or internal companies (Gaspersz, 2007). The usefulness of Malcolm Baldrige is so wide in its implementation, that it can be applied in manufacturing / service companies (Crosby, 1986). It is interesting to conduct research that leads to mapping the topics surrounding the use of Malcolm Baldrige in different types of companies. One approach that can be done to map research topics is a systematic mapping study. Malcolm Baldrige is a performance appraisal method that has completeness and perfection compared to other work assessment methods (Borawski and Brennan, 1992). According to Yopy & Sijinjak (2018) Malcolm Baldrige has an



established, strong, and standardized model that aims to improve and empower the company's competitiveness and is used strategically in a wide variety of businesses. In addition, Malcolm Baldrige has the use of an approach to identifying a company's reference, as well as helping to evaluate improvements and disseminate its best practices to internal companies and customers (Abdimomunova and Valerdi, 2010).

According to Denis (2006) Malcolm Baldrige is one of the methods that can be used to carry out quality mapping in a company. In addition, Malcolm Baldrige in its implementation can be used to compare the quality of products and services from the perspective of the company's internal parties with the perspective of external parties, namely customers (Dasaranti, Arifianti and Tresna, 2018). In research Dsouza & Sequeira (2012) Malcolm Baldrige is used in performance measurements with the direction of achieving quality, has several criteria that can be used such as leadership, strategic planning, customer focus, measurement, analysis and management knowledge, workforce focus, operation focus, and results.

Systematic mapping studies emerged when the Study Literature Review (SLR) was introduced to research or research in the medical field. Systematic mapping study are one of the secondary study methods that receive a lot of attention, because they can dig into existing scientific articles and study them in depth from several perspectives (Kitchenham, Dyba and Jorgensen, 2004). The phase for conducting systematic mapping studies is to use the Scopus electronic database, with the hope of obtaining similar and credible research (Thaha *et al.*, 2021). The importance of measuring performance using Malcolm Baldrige in various types of companies led researchers to map out topics related to it. According to Kitchenham *et al.*, (2004) Systematic mapping studies are used to identify the breadth and form of literature on a particular topic, or also called scoping studies.

Systematic mapping studies are suitable for use when it is seen that there is evidence available or when the topic area is too wide during the initial examination before the systematic review is carried out (Banaeianjahromi and Smolander, 2016). In essence, the use of systematic mapping studies is the initial step or approach to develop and map future research (Akkermans *et al.*, 2003). Conducting research with systematic mapping studies has broad benefits for reducing bias, recognizing the research context, as well as making it possible to produce new research maps (Rizal *et al.*, 2017). So this study will analyze the literature on the topic of the use of Malcolm Baldrige in various types of companies, from the results of previous studies using the Scopus database. Several research questions are prepared, in order to answer and see developments and map future research. The research questions include:

- What is the locus and research focus of the article obtained?
- How is the research method used from the article obtained?
- What is the publication trend by country and year of the article obtained?

METHODS OF RESEARCH

The method used in this study is a systematic mapping study. The research conducted is expected to provide information in the form of mapping related to the topic of using Malcolm Baldrige in various types of companies. Systematic mapping study are generally used to study productivity and evaluate previous research in a quantitative way (Arifianti, Thaha and Taharuddin, 2021). Another use of systematic mapping studies is to find out and understand whether a study being carried out has an update (Petersen *et al.*, 2008). Conducting systematic mapping studies requires electronic databases that can be used, one of which is the Scopus database. The Scopus Database is a collection of reputable international scientific articles (Arifianti, Thaha and Taharuddin, 2021). Scopus is also one of the comprehensive databases covering various fields of science such as science, technology, health, social sciences, arts and also humanities (Thaha *et al.*, 2021).

The data source used in this study was through online searches through the Scopus database. Then the data source is carried out a filtering process with several steps from the data source obtained. The search and filtering process is presented through Table 1.



Table 1 – Filtering Process from Database Scopus

No	Filtering Process	Results
1	String keyword	"Malcolm Baldrige" AND "Service" OR "Manufacture"
2	Year	1990-2020
3	Subject Area	Business, Management and Accounting
4	Document Type	Article
5	Publication Stage	Final
6	Source Type	Journal
7	Language	English

The steps of discovery of the article in the study adopt the concept of Petersen et al., (2008). In systematic mapping studies, the discovery step, especially articles, is a process that reflects the results of a structured research map (Kitchenham, Dyba and Jorgensen, 2004). In full the steps of the discovery of the article in the study are presented through Figure 1.

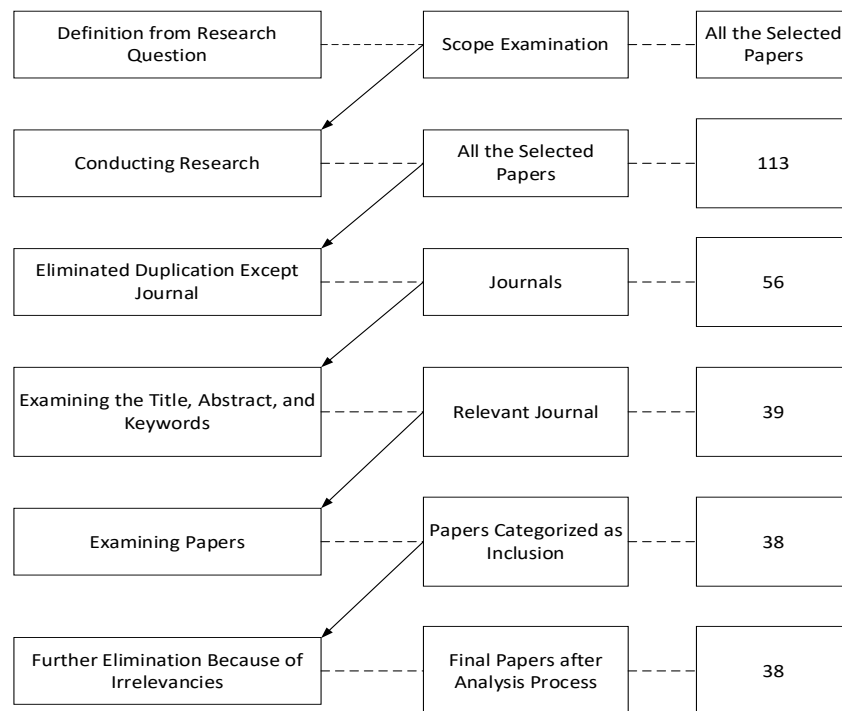


Figure 1 – Discovery Steps

Based on Figure 1, the findings of the Scopus database obtained the results of all 113 articles, on the topic of the use of Malcolm Baldrige in all types of companies. Furthermore, the elimination process is carried out by classifying articles, the total according to the results of elimination and classification is obtained 56 articles. After that, a manual screening process is carried out to see how many articles are relevant to the topic being studied, the results are 39 journals. The last process carried out was to analyze the 39 relevant journals, the result was that there were 38 journals that were in accordance with the research topic. So that 38 articles will be carried out a systematic mapping study process regarding the locus and focus of research, types of research methods, and publication trends by year and country.

The classification step is used to determine the indicators in order to become selected articles and according to the research topic being studied, especially regarding the use of Malcolm Baldrige in all types of companies. This classification step is useful in determining the type of research method from the articles that have been obtained (Petersen *et al.*, 2008). Figure 2 describes the article classification process and Table 2 describes the inclusion step through categories that include types of research methods (Musianto, 2002).

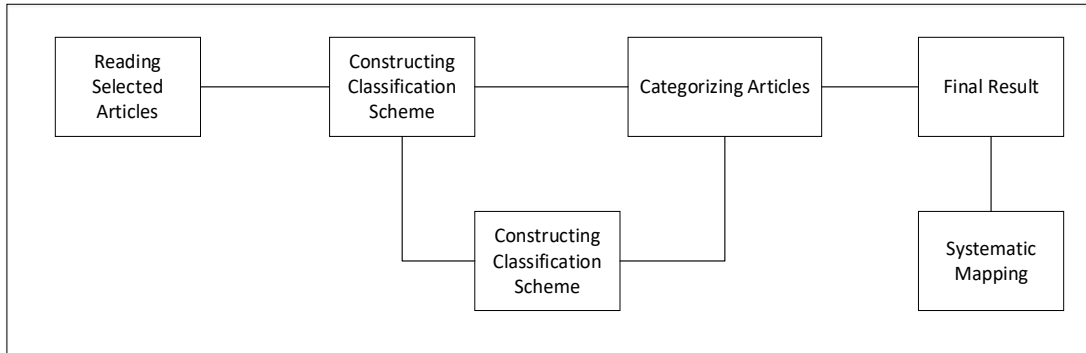


Figure 2 – Classification Steps

Table 2 – Category Classification of Types of Research Methods

No	Research Methods	Description
1	Quantitative Method	This method includes designs, samples, as well as statistically formulated and completed hypotheses.
2	Qualitative Method	This method is carried out by including a fast assessment process, the use of secondary data, ethnography, group discussions, structured and in-depth interviews, and language analysis.
3	Mixed Method	This method combines qualitative and quantitative approaches during the data collection process as well as all stages of research.

RESULTS AND DISCUSSION

The results and discussions contained in this study include the results of a systematic mapping study of articles on the topic of Malcolm Baldrige in various types of companies. The results of this study also contain answers to research questions such as the distribution of loci and research focus, types of research methods and publication trends (country and year). The results are explained through the discussion below.

Locus Distribution and Research Focus. The locus and focus of the research were discussed to answer RQ₁ based on the results of mapping 38 articles on the topic of Malcolm Baldrige in various types of companies. The database used to obtain article mapping information is Scopus. The results of the research locus from the mapping results are presented through Figure 3.

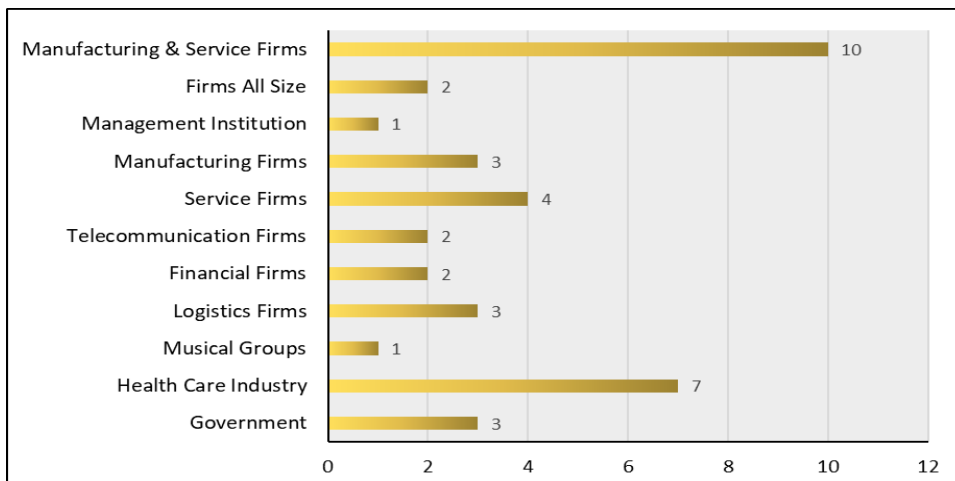


Figure 3 – Distribution of Research Locus

Referring to Figure 3 which presents the locus of research from the mapping results of 38 articles. The locus that most research is carried out is in service and manufacturing companies simultaneously with 10 studies or as large as 26,3% (Henry, 1990; Stahl *et al.*, 1999; Swyt, 1999; Chatzkel, 2000; Angell, 2001; Prajogo, 2005; Moon *et al.*, 2011; Enquist,



Johnson and Rönnbäck, 2015; Ooi, 2015; Abbas, 2020). The second most common locus that many studies have done is in the health industry with 7 studies or as large as 18,4% (Meyer and Collier, 2001; Palani, Deshmukh and Wadhwa, 2007; Griffith, 2009; Lee, Lee and Olson, 2013; Schulingkamp and Latham, 2015; Kapp *et al.*, 2017; Baidoun, Salem and Omran, 2018). Furthermore, the third most locus that many researches are carried out are in service companies, as many as 4 studies or as large as 10,5% (Collier, 1992; Zhao, Yeung and Lee, 2004; Lam, Wang and Lam, 2008; Jayaraman, 2013).

The rest of the research contributions regarding the use of Malcolm Baldrige occurred in manufacturing companies (Cortada, 1993; Terziovski, Sohal and Moss, 1999; Da Silva, Tadashi and Kikuo, 2005), in logistics companies (Anderson, Jerman and Crum, 1998; Lobo and Zairi, 1999; Shaiq *et al.*, 2020) and in government institution (Harwick & Russell, 1996; Prybutok *et al.*, 2011; Prybutok *et al.*, 2008) with 3 studies each or as large as 7,9%. Other contributions are made to the locus of research in all-sized companies (Chandler, 1998; Dubey, 2016), telecommunications companies (Frank, 1995; Hines, 1995), and in financial companies (Daniels, 2002; Hughes and Halsall, 2002) each of which loci contributes with 2 studies or as large 5,3%. The rest is based on the results of article mapping, 2 studies with contributions of 2,6% carried out in the management of the institution (Cauchick, 2008) and in musical groups (Fisher *et al.*, 2010).

Based on the results of article mapping through the research locus, the potential for research to be carried out in the future can continue to be developed. The locus of research can be researched to fill in the extent of the phenomena that are occurring. By using the Malcolm Baldrige method, it applies to conducting research in the tourism industry and in educational institutions other than those in the category of service companies or manufacturing. Furthermore, the results of mapping the research focus are presented through Figure 4.

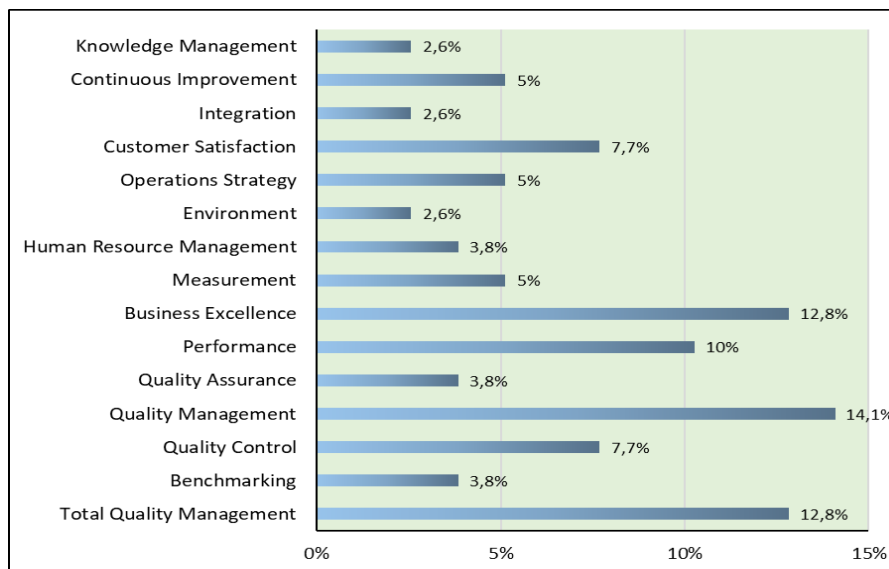


Figure 4 – Distribution of Research Focus

Referring to Figure 4 regarding the research focus of the mapping results of 38 articles on the topic of using Malcolm Baldrige in various types of companies. The results obtained that the most research focused was the focus on the application of quality management, with a contribution of as large as 14,1%. The focus of the application of quality management is stated through several studies in order to achieve the product / service results that customers expect (Anderson *et al.*, 1998; Cauchick Miguel, 2008; Griffith, 2009; Henry, 1990; Lee *et al.*, 2013; Moon *et al.*, 2011; Palani *et al.*, 2007; Prybutok *et al.*, 2011; Shaiq *et al.*, 2020; Terziovski *et al.*, 1999; Zhao *et al.*, 2004).

The second largest contribution of the research focus based on the results of mapping on the use of Malcolm Baldrige, namely the focus on the application of Total Quality



Management (TQM) and also the achievement of the company's business excellence, with their respective contributions of 12,8%. Several studies have revealed that the application of TQM is expected to make it easier for companies to achieve their business advantages (Frank, 1995; Chatzkel, 2000; Hughes and Halsall, 2002; Zhao, Yeung and Lee, 2004; Jayaraman, 2013; Lee, Lee and Olson, 2013; Schulingkamp and Latham, 2015; Dubey, 2016). So that the entire process in the company implementing TQM is one of the relevant tools in achieving the general goal of having the best quality (product / service) that customers expect (Hines, 1995; Harwick and Russell, 1996; Swyt, 1999; Terziovski, Sohal and Moss, 1999; Da Silva, Tadashi and Kikuo, 2005; Prajogo, 2005; Lam, Wang and Lam, 2008; Ooi, 2015; Baidoun, Salem and Omran, 2018; Abbas, 2020).

The third largest contribution regarding the research focus of the mapping results around the topic of using Malcolm Baldrige in various types of companies, namely the focus on improving performance with a contribution of 10%. Research with this focus reveals that the company's performance will have a close effect on the quality of the company's products/services presented to customers. So that research with a focus on performance when useful for the sustainability of the company in evaluating the entire process carried out by the company (Abbas, 2020; Anderson et al., 1998; Collier, 1992; Frank, 1995; Lee et al., 2013; Prybutok et al., 2011; Schulingkamp & Latham, 2015).

Another focus is the research focus on customer satisfaction and quality control, with each contributing as much as 7,7%. Research from the mapping results reveals that the two focuses are interrelated (Cortada, 1993). Referring back to the focus of research on the application of TQM or quality management in various types of companies, the customer satisfaction created is a continuous final process for the business run by each company (Hines, 1995; Anderson, Jerman and Crum, 1998; Daniels, 2002; Schulingkamp and Latham, 2015). As for quality control, it is a process used by companies to achieve the quality of the products/services offered (Henry, 1990; Frank, 1995; Chandler, 1998; Swyt, 1999; Meyer and Collier, 2001).

Furthermore, the focus of research on the use of Malcolm Baldrige in various types of companies, many studies use it as a tool for measuring company performance (Fisher et al., 2010; Lam et al., 2008; Prybutok et al., 2011; Swyt, 1999), as the company's operating strategy (Angell, 2001; Meyer and Collier, 2001), and also for continuous improvement in the company's processes (Jayaraman, 2013; Schulingkamp and Latham, 2015). The contribution of each of these focuses is based on the mapping results, which is as large as 5%. Another focus of using Malcolm Baldrige with a contribution of 3.8% is for a comparison tool with competing companies (Lobo and Zairi, 1999; Swyt, 1999; Griffith, 2009), as a tool to guarantee the quality of the company's products/services (Stahl *et al.*, 1999; Daniels, 2002), and also as a tool to assess the performance of human resources in a company (Chatzkel, 2000; Dubey, 2016). In essence, the focus of the research is to provide quality assurance offered, by updating the process related to the performance of human resources with one of the steps that is widely used is to make competing companies as a comparison to obtain the right quality assurance for customers (Prybutok et al., 2008).

Another research focus in the use of Malcolm Baldrige in various types of companies with a contribution of 2.6% is used to face the business environment (Angell, 2001; Dubey, 2016), to deepen the knowledge management of the company (Enquist, Johnson and Rönnbäck, 2015; Ooi, 2015), and also to integrate all processes in the company that are contrary to the environment with the company's management capital owned (Kapp *et al.*, 2017; Shaiq *et al.*, 2020). In principle, the research focuses obtained on the mapping results of 38 articles can be used as capital for future research development, especially in the use of Malcolm Baldrige.

Distribution of Research Methods. The distribution of research methods was discussed to answer RQ₂ based on the results of mapping 38 articles on the topic of Malcolm Baldrige in various types of companies. The database used to obtain article mapping information is Scopus. The results of the research method from the mapping results are presented through Figure 5.

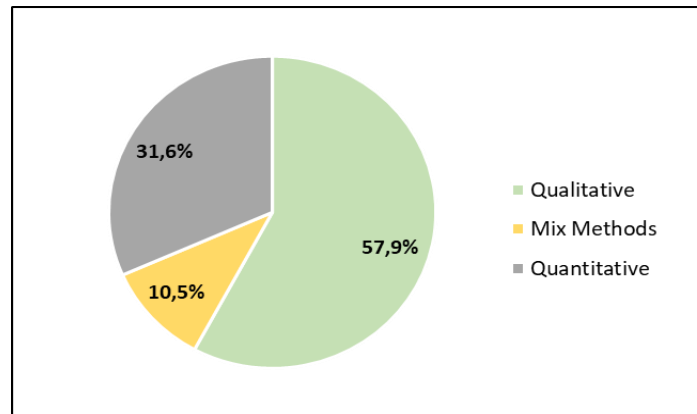


Figure 4 – Distribution of Research Methods

Referring to Figure 5 regarding the distribution of research methods from the mapping results of 38 articles using the Scopus database. The use of Malcolm Baldrige in service and manufacturing companies, dominated by qualitative research with a contribution of 57.9%. The majority of qualitative research is conducted in service and manufacturing enterprises simultaneously (Henry, 1990; Stahl *et al.*, 1999; Swyt, 1999; Chatzkel, 2000; Angell, 2001; Enquist, Johnson and Rönnbäck, 2015).

Furthermore, for the distribution of quantitative research methods from mapping results, the use of Malcolm Baldrige in various types of companies contributed 31.6%. Research using quantitative research methods is mostly carried out in the health industry (Meyer and Collier, 2001; Palani, Deshmukh and Wadhwa, 2007; Lee, Lee and Olson, 2013; Schulingkamp and Latham, 2015; Baidoun, Salem and Omran, 2018). Furthermore, the distribution of mixed research methods in using Malcolm Baldrige in service and manufacturing companies contributed 10.5%. Research using mixed research methods is mostly conducted in manufacturing companies (Terziovski, Sohal and Moss, 1999; Da Silva, Tadashi and Kikuo, 2005), in logistics companies (Shaiq *et al.*, 2020), and also on musical groups (Fisher *et al.*, 2010).

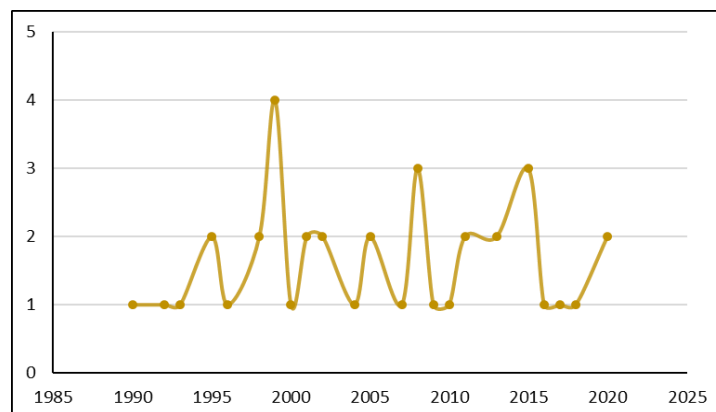


Figure 6 – Publication Year Trends

In developing research using Malcolm Baldrige in the future, research from the mapping results of these 38 articles can be used as a reference and reference. The use of research methods can be adjusted through the locus and focus of the research faced. So that the use of research methods, be it qualitative, quantitative, or mixed, can be determined by referring to the phenomena that occur in the environment being studied.

Distribution of Research Publication Trends. The distribution of publication trends is discussed in order to answer RQ₃ based on the results of mapping 38 articles on the topic of using Malcolm Baldrige in various types of companies. The database used to obtain article mapping information is Scopus. The distribution of publication trends refers to the year of



publication as well as the country of affiliation; the results of the mapping are presented through Figure 6.

Referring to Figure 6 regarding publication trends by year, from the results of mapping 38 articles on the use of Malcolm Baldrige in various types of companies. The trend of publications from year to year experienced a fluctuating rate, the most widely carried out distribution of research was in 1999 (Lobo and Zairi, 1999; Stahl *et al.*, 1999; Swyt, 1999; Terziovski, Sohal and Moss, 1999) with 4 studies or 10.5%. The second most research was conducted in 2008 (Cauchick Miguel, 2008; Lam *et al.*, 2008; Prybutok *et al.*, 2008) and the year 2015 (Enquist, Johnson and Rönnbäck, 2015; Ooi, 2015; Schulingkamp and Latham, 2015) with 3 studies each or 7.9%. Broadly speaking, research using Malcolm Baldrige conducted in various types of companies, based on the Scopus database occurred in the range of 1990-2020. Furthermore, it discusses publication trends by country, presented through Figure 7.

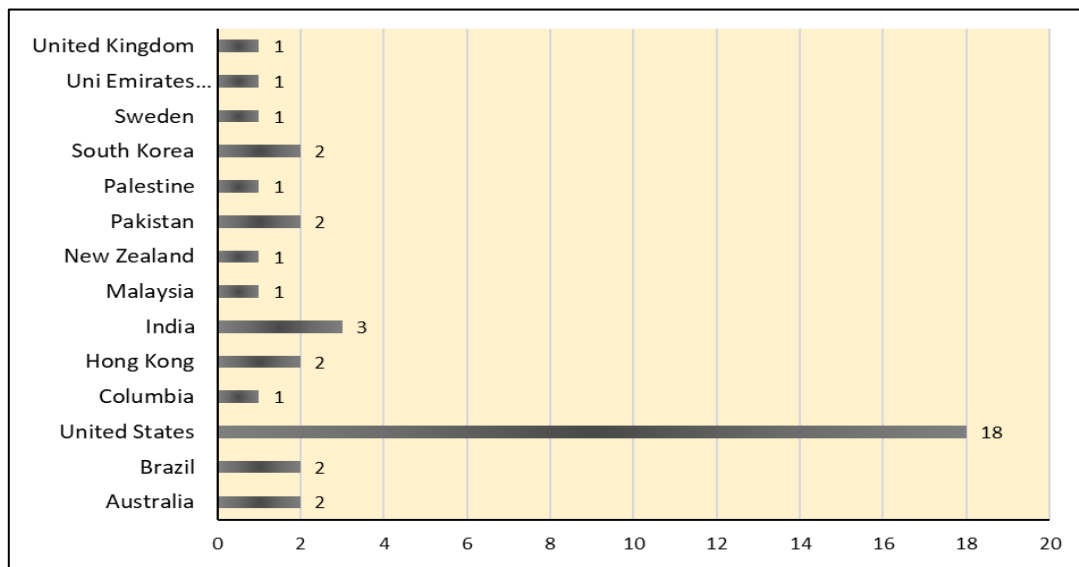


Figure 7 – Publication Country Trends

Referring to Figure 7 regarding the distribution of publication trends by country from the mapping results of 38 articles, the United States dominates with 18 studies or 47.4% (Anderson *et al.*, 1998; Chandler, 1998; Chatzkel, 2000; Collier, 1992; Cortada, 1993; Daniels, 2002; Fisher *et al.*, 2010; Frank, 1995; Griffith, 2009; Harwick & Russell, 1996; Henry, 1990; Hines, 1995; Meyer & Collier, 2001; Prybutok *et al.*, 2011; Prybutok *et al.*, 2008; Schulingkamp & Latham, 2015; Stahl *et al.*, 1999; Swyt, 1999). The second country that dominates from the Asian part is India with 3 studies or 7.9% (Palani, Deshmukh and Wadhwa, 2007; Jayaraman, 2013; Dubey, 2016). Other countries that contributed with 5.3% or as many as 2 studies each conducted by Korea Selatan (Moon *et al.*, 2011; Lee, Lee and Olson, 2013), Pakistan (Abbas, 2020; Shaiq *et al.*, 2020), Hong Kong (Zhao, Yeung and Lee, 2004; Lam, Wang and Lam, 2008), Brazil (Da Silva, Tadashi and Kikuo, 2005; Cauchick, 2008), and Australia (Terziovski, Sohal and Moss, 1999; Prajogo, 2005). The distribution of countries in the mapping results indicates that the use of Malcolm Baldrige in various types of companies occurs in different countries. It considers that Malcolm Baldrige is a tool for evaluating, in dealing with situations and conditions that are being faced or that will occur.

Overall, the results of filtering articles based on the country of publication are dominated by countries in the Asian continent with 7 countries, namely the United Arab Emirates, South Korea, Palestine, Pakistan, Malaysia, India, and Hong Kong. Then from the American continent there are 3 countries, namely the United States, Brazil, and Colombia. The European continent has 2 countries, namely the United Kingdom and Sweden, while the Australian continent, the countries of New Zealand and Australia dominate also from the results of filtering.



CONCLUSION

Based on the results of the discussion and the objectives of the study obtained, first the distribution of the most researched locus, namely in manufacturing and service companies simultaneously with 10 studies (26.3%). As for the focus of research that is most widely carried out, namely the application of quality management with 11 studies (14,1%).

Second, regarding the distribution of types of research methods, the results were obtained that the most dominant research method carried out was qualitative research methods with 22 studies (57.9%). Then quantitative research methods became the second most with 12 studies (31.6%), and finally mixed research methods contributed with 4 studies (10.5%). Third regarding the distribution of research publication trends, the peak of research on the use of Malcolm Baldrige in various types of companies occurred in 1999 with 4 studies (10.5%). Then finally regarding the country that conducted the most research, namely the United States with 18 studies (47.4%), and the second country, namely India with 3 studies (7.9%).

This research is expected to provide information for further research, to develop research around the topic of using Malcolm Baldrige in various types of companies through the locus, focus, and research methods used. The limitation of this study is that it only uses the Scopus electronic database, a suggestion for subsequent research that by using systematic mapping studies can use more databases. In the hope of broadening horizons and information about the use of Malcolm Baldrige in various types of companies.

The country that conducted the most research was the United States, and the peak of the most research by Year of publication occurred in the Year of publication occurred in the Year of 1999. Seeing these results can be used as a research recommendation in Indonesia in applying the Malcolm Baldrige method through the results of loci, focus, and types of research methods carried out by previous researchers.

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