

Forgotten contributions to scientific management: work and ideas of Karol Adamiecki

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Abstract

Purpose – This paper aims to present the work and contributions of Karol Adamiecki in comparison with Frederick Winslow Taylor and discusses the various contexts in which both scholars conducted their research. The purpose of this study is bring to light some of the main accomplishments of Adamiecki and contribute to the discussion of reasons why the work of some scholars draws wide acclaim, while similar work of others remains unnoticed.

Design/methodology/approach – The background for the discussion is the work and ideas of Karol Adamiecki, a Polish engineer and manager, whose methods and findings were similar to those of Frederick Taylor and are contemporary, and, in some cases, precede those of the Father of Scientific Management. The methodology used in this study is a review of the original work of Adamiecki and Taylor to find the true meaning and purpose behind their writings, as well as a review of relevant literature regarding the context of the realities in which both scholars constructed their research.

Findings – The concepts and inventions of Karol Adamiecki are, in many aspects, similar to those of Frederick Taylor and his followers. Several factors are identified and discussed which may have influenced the varied level of recognition of conceptually similar ideas evolved in different parts of the world. These factors are, among others, the socio-political reality of Eastern Europe and Poland under the influence of Russia and the Soviets as compared to that of the USA and the Western World and the support of various interest groups and government institutions, as well as the impact of the academic circles.

Research limitations/implications – In today's world of globalization reaching all aspects of life, it is necessary to recognize and acknowledge the developments emerging in different settings, regions and cultures. Furthermore, the social and political realities in which research is constructed may impact the future acceptance, dissemination and popularity of the findings and authors.

Originality/value – Although some research exists outlining the work of Adamiecki, this study contributes to the body of historical management knowledge by focusing on the main accomplishments of Adamiecki based on his original writings and placing his accomplishments in a historical context in comparison to Taylor, thus analyzing the reasons for the lack of wider acclaim for Adamiecki's contribution to scientific management.

Keywords Management history, Scientific management, Frederick Taylor, Contribution, Idea adoption, Karol Adamiecki

Paper type General review



In March 1903, F.W. Taylor for the first time presented his rules and methods stating a fundamental thought that the issue of labor organization can and ought to be resolved according to strictly scientific principles, and not, as it had been the case, according to

intuition. By peculiar coincidence, in February of that year, in a presentation given at the Technical Society in Ekaterinoslav [...] I have voiced the same thought and I have outlined the method of collective labor organization. This presentation was a report of my initial work and research on this issue which I had begun in year 1895 (Adameiecki (1924, p. 551)[1].

Introduction

Why did the Wright brothers gain all the credit for conceptualizing and building the first airplane and conducting the first successful flight in history? There were many constructors, who had highly developed plans, ready-built gliders and airplanes and even scored a controlled flight (Cheparukhin, 1988). Yet, it was the Wright brothers who received the attention and, subsequently, the funding for their projects. All this despite the fact that they had built their ideas upon the findings of George Cayley, Sam Langley and Otto Lilienthal and consulted on their projects with other aeronautical researchers, such as Octave Chanute (Howard, 1998). History knows more examples where the work of some catches all the acclaim, while similar work of others goes unnoticed. The history of management reveals one such example.

In Ekaterinoslav, Russia, in February 1903 – one month before the publication of Frederick Taylor's *Shop Management* – a lecture was given that had the potential to have a tremendous impact on the future development of the management field. It was a presentation of methods, results and conclusions of a program of research carried out by Karol Adameiecki (1866-1933). This Polish engineer observed a group of 16 workers and focused his attention on the length of each movement in their assigned task, as well as the length of the rest periods. The outcome of his study was the development of a *harmonograph* – a chart depicting the movements and actions of the workers and indicating the causes of low productivity, such as lack of harmony and weak coordination of consecutive operations. Sound familiar? It should to those acquainted with the work of Frederick Taylor.

Nevertheless, the work of Karol Adameiecki has received little attention in the Western world, especially as compared to the acclaim given to the *Father of Scientific Management* and his disciples, whose work is now considered most influential in terms of the development of early management thought. Frederick Taylor is universally considered one of the main contributors to the management thought and practice (Wren and Hay, 1977) and his *Principles of Scientific Management* have been called the “most influential book on management ever published” (Bedeian and Wren, 2001). The main aim of this paper is to bring forth the achievements of Karol Adameiecki and contribute to the discussion concerning the reasons why the work of some draws wide acclaim, while similar work of others goes virtually unnoticed. To illustrate the reasons why such differences in the degree of adoption and popularity of ideas occur, this study explores the socio-political realities in which Adameiecki conducted his work and propagated his ideas in comparison with the conditions faced by Frederick Taylor and his followers. To this end, several factors are identified and discussed which may determine the popularity of an idea among a global public. In addition, to answer Simha and Lemak's (2010) call for basing research studies on original sources rather than their interpretations, the conclusions of this study are largely based on the review of original writings of both Adameiecki and Taylor.

This study addresses the above issues by first reviewing the early life, education path and career accomplishments of Adamiecki and comparing them to the education and career of Taylor in the context of the economic conditions which induced the need for a more structured approach to management research and practice, as well as in the context of the social and political circumstances that exhibited fundamental differences, which, in the end, may have contributed to the differences in the dissemination and esteem of the ideas developed by Taylor and Adamiecki.

Finally, with respect to the specificity of adoption of management-related ideas, research and trends, six overarching contextual perspectives have been identified in literature: rational, psychodynamic, dramaturgical, political, cultural and institutional (Sturdy, 2004). To contribute to the discussion of why research and ideas fail to gain acclaim, in this paper, the circumstances in which Adamiecki and Taylor were carrying out their research are compared in the context of the above overarching views and socio-political contexts.

Karol Adamiecki – work and research in the Soviet-influenced reality

Karol Adamiecki was born on March 12, 1866 in Dąbrowa Górnicza in Poland. His father was a mining engineer, which may have had some initial impact on young Karol's decision to begin polytechnics studies in Łódź, Poland, and continue in this educational direction in St. Petersburg, Russia, at the Institute of Technology. It was in this Institute that he received his degree in technological engineering in 1891.

Adamiecki is a recognized and acknowledged figure in Polish and Eastern European management academic circles. His work is considered a precursor of what is now called scientific management. Many scholars, especially those from Eastern Europe, compare him to Frederick Taylor due to the subject of his research, ways in which he conducted experiments and conclusions he had drawn from his studies (Wesolowski, 1978). Although the concepts, methodology and findings of Adamiecki and Taylor were very similar and were prompted by the needs that emerged in the new economic realities of the late nineteenth and early twentieth century, the social and political realities in which the two scholars constructed their research and popularized their findings were quite different.

Adamiecki began his academic work as a professor of mechanical technology and engineering at the Warsaw Polytechnic Institute in 1919. Along his years of practical experience and research, he developed ideas and methods on methods of industrial organization and management, which he started to advocate in 1920 with some of his colleagues. His motivation to popularize the knowledge of the new method of management in industry led him to the foundation of the Polish Institute of Scientific Management in Warsaw in 1923. He became the director and chairman of the board of the Institute and remained its leader until his death in 1933. In 1924, as one of the activities of the Institute, he and his colleagues organized the First Polish Congress of Scientific Management and sent a delegation to Prague to attend the First International Congress of Management and Organization. Adamiecki was also involved in multiple international administrative activities, including serving as the Vice-President of the International Committee of Scientific Management in Brussels in 1925 (Wesolowski, 1978).

At the time when Taylor began developing his ideas, academics and practitioners in Europe and the USA had already started investigating ways to connect two activities that constituted the greatest part of factory management – engineering and accounting (Urwick, 1963). Subjects of interest were incentive issues, output and performance control of production processes, cost accounting and others. Aware of these developments but unaware of each other's work, Taylor and Adamiecki independently recognized and pursued the need for a more structured approach and an in-depth investigation of the very foundation of these issues – the process of actions of a single worker at a particular time.

Adamiecki began his professional activity slightly later than Taylor. It was in 1891 that he started working as an engineer at the Bank Smelting Works in Dąbrowa Górnicza. In 1896, he initiated his research on improving the productivity of the rolling mill in the factory. It is significant that his methods, which included work-flow network concepts, were used so early in Eastern Europe, as they are generally considered to have emerged first in the USA, and as late as 1957. An example of a resembling technique is considered to be the Program Evaluation and Review Technique, also known as PERT (Marsh, 1975).

Adamiecki's work on productivity improvement continued for three years before he moved to Lugansk, where he was put in charge of the rolling mills at the Hartman Smelting Works. In 1901, he became a technical director of the Ekaterinoslaw Foundry in Russia. Between 1906 and 1918, Adamiecki consulted in Poland and Russia on engineering matters and worked as a director of the Ostrowiec Foundry. During this period of time, he also served as a technical advisor in the Bogusławski Foundry in the Ural Mountains. As a managing director of the Ceramic Works in Korwinów, in the years 1907-1911, he was involved in design activities concerning, for example, ceramic furnaces – several of which were his own inventions. His career was dynamic and multi-tasked in those years. It was also the time when he developed most of his groundbreaking ideas.

Considering the political and social situation of the time, it is noteworthy that Adamiecki was allowed to stay in Russia and continue his work and research on the industrial analysis methods after the October Revolution. He was, however, subject to criticism related to his research methods and results, as well as conclusions and recommendations drawn from his studies. Adamiecki and his co-workers were, for instance, accused of sabotage activities, as part of the steel plant was having shortages in electrical energy required to achieve the requested output. He was facing various charges, dismissal and possibly deportation, had he not kept a record of the activities in the plant. Using the charts and graphs of his own design, he was able to prove that the shortages had resulted from the new order implemented at the factory as imposed by the administration and had nothing to do with Adamiecki and his engineers' work. As a result, he was permitted to continue his research work in Russia and Poland.

Still, the above incident serves as an example that innovative work methodology, regardless of its merit, was difficult to popularize in Poland and Russia. Such resistance stood in contrast with the call for efficiency and exceeding the quotas, which was propagated by the Soviet leadership.

Interestingly, Adamiecki's attitude in his early writings, when Poland was still under Russian rule (prior to 1918)[2], was not nearly as revolutionary as that of

Taylor. Adamięcki was almost exclusively referring to the methods aimed at increasing efficiency, while Taylor's intentions were already transforming to promote creation of a better society through eliminating conflict using scientific methods (Zuffo, 2011). Even if Adamięcki had a similar ultimate purpose in mind, the political reality of that time would not allow for such an avant-garde tone in his writings or lectures.

On the other hand, in the second decade of the twentieth century, the Soviet leadership began to refer more favorably to the tenets of scientific management. Lenin started to write about Taylor and his ideas in positive terms as such that may help the Soviet revolution achieve the desired efficiency and productivity levels (Beissinger, 1988). According to Czerniawska (2011), Lenin referred to Taylor when he admitted that the Soviet Union would learn from the "devil himself" to overcome productivity issues. It is therefore surprising that Adamięcki's work was not more widely utilized by the socialists, even if only for the purpose of propaganda without much practical implementation, as he and his ideas could have been claimed by the communist leaders as untainted by "western imperialist ideology" – an issue of continued concern for Soviet – and subsequently communist governments in Eastern Europe when attempting to apply Western solutions. As authors acknowledge, however, Lenin's advocacy of Taylorization had primarily political premises rather than being aimed at actually improving productivity in practice (Wren and Bedeian, 2004) and thus Lenin, due to Taylor's already high level of popularity, may have considered his ideas as potentially more impactful in the political arena than those of Adamięcki.

Along with Lenin's positive attitude toward Taylor, a Russian revolutionary – Alexei Gastev – played a significant role in popularizing Taylor's methods in the Soviet state (Beissinger, 1988). Gastev saw the scientific method as a means to achieve a cultural revolution and, more specifically, to make each man a manager – a view shared by Lenin. Gastev was, therefore, a Russian counterpart of numerous followers of Taylor in the USA and Western Europe, who helped disseminate Taylor's ideas not only into various professional and managerial but also political and academic circles – an activity that had a great impact on the popularity of Taylor and is discussed later in this article. Until 1920, neither Lenin nor Gastev had sufficient support in this regard. In fact, after disassociating himself from the Bolsheviks, Gastev was exiled. However, after World War I (WWI), the Soviet economy needed an efficiency boost and thus the Bolshevik commitment to industrialization pushed the Soviet leaders to embrace scientific management. Gastev was back in Russia and continued promoting the Taylor approach. He became a prominent figure and, at the height of his influence, used terms such as "Soviet Americanism", which was significant considering the dominant antipathy of the Soviets toward the West (Bailes, 1977; Traub, 1978).

Gastev continued his activity and received support to establish the Central Institute of Labor dedicated to conducting managerial research. He had over 50 teams working under his auspices to investigate not only increasing productivity but also issues such as rationalizing education, improving harvests and eliminating excessive lines at stores, even such remote topics as curing syphilis (Beissinger, 1988). Such extensive research efforts, openly based on Western scientific ideas, attracted the attention of the Soviet leadership. After Lenin's death in 1924, the

support for Gastev's efforts started to decline, and Stalin's rise to power in the late 1920's ended the Soviet commitment to scientific management. The resistance against Western methods of regulating work in the Soviet Union became so harsh that by 1938, Gastev's followers were either imprisoned or killed, while Gastev himself was captured and executed for his activities that had been deemed counter-revolutionary (Stites, 1991). Nevertheless, the support that Lenin lent Taylor, as well as Gastev's commitment to scientific management, left their mark and contributed to the awareness of Taylor and his ideas in Russia and consequently Poland and Eastern Europe and overshadowing the potential interest in Adamiecki's accomplishments.

Although scientific management research rarely translated into actual practice in the Soviet-influenced territories due to the Bolshevik distrust of the capitalistic ideas and methods, there were others who engaged in similar activities (Wren, 1980). Walter N. Polakov's activity is beyond the scope of this study, but his contributions in terms of popularizing the Gantt charts in Russia are significant. In reality, the Soviets in their drive toward national planning needed the help of the latest Western achievements in efficiency, but the fact remains that officially there was a generally high level of distrust toward capitalist-originated ideas. Consequently, Adamiecki – although he was allowed to work in Ekaterinoslav for a period of time and make substantial improvements in terms of efficiency – also was later a target of attacks and adverse claims (Adamiecki, 1924). The attacks and accusations were of similar nature to those experienced by Taylor – exploitation of workers.

The socio-political reality in Poland and the Soviet Union, in which systematically applying the principles of the scientific approach to management was practically impossible, is discussed by Wren and Bedeian (2004). The authors conclude that after Polakov left the Soviet Union in 1931, the Soviets made an attempt to hire the consulting services of Henry Wallace Clark to remedy the productivity issues. Clark refused due to reasons related to the fact that attempting to fix such problems by advising people who make decisions from a political point of view would not be possible. As was later the case in the communist regimes throughout the eastern bloc, the success of planning would depend largely upon politics and not the systematic work that is necessary for appropriate application of scientific management principles. First, however, came the World War II.

Adamiecki's ideas – World War II and the communist regime

Adamiecki was very active in promoting his ideas through lectures, as well as engagement at the International Committee for Scientific Management and the International Management Institute in Geneva. He was awarded several international honors for his achievements in increasing efficiency. After his death in 1933, the Warsaw Polytechnic, as well as various other groups founded by Adamiecki, continued to advance his work and certainly had the potential to further promote his ideas of harmonization. Alas, around the time of Adamiecki's passing, Hitler came to power, and in 1939, Poland was divided between the Soviet Union and Germany. Most of the organizations that Adamiecki had founded and factories in which his theories and methods were implemented were destroyed in World War II. Very few were still in existence after the war – instead, new organizations and new factories were created. Those, however, due to the communist regime, heavily

influenced by the Soviet Union, were assigned Soviet production methodology. The communist method relied primarily on command and strict control and had little to do with efficiency and harmonization of labor (Witzel, 2006).

Paradoxically, while the mottos and slogans of the communist government emphasized efficiency and equal redistribution of the fruits of the society's labor, such overarching ideals had little reflection in practice. In reality, the economy was characterized by high levels of waste, notorious lack of supplies and the inefficiency of the supply chains. This was the case in most communist bloc countries, which can be traced back to Lenin's times in Soviet Russia. Wren and Bedeian (2004) concluded that while Lenin wished to convey the message of his regime being progressive, efficient and promoting the use of the most modern efficiency-based management methodology, in reality, his praise and advocacy of scientific management was merely a rhetoric means to achieve political ends, rather than a sincere promotion and practical dissemination of scientific management methods throughout the industry in post-revolutionary Russia. In fact, in 1918, after the October 1917 revolution and after Lenin had changed his view of scientific management (characterized at first by condemning it for exploitation of the worker, to praising it for efficiency), the industrial output rate was one-third of that in 1913 (Traub, 1978).

Consequently, in communist Poland, factory management cadres did not have the authority to freely apply efficiency methodologies because such freedom would disrupt the broader nation-wide control mechanisms and thus limit the power of the communist regime. Central to the above arguments is the fact that all factories and organizations were state-owned in Poland and most communist countries after World War II and private business ownership was non-existent. Accordingly, unless the communist government was to centrally impose Adameiecki's efficiency and harmonization principles across factories, his methods were bound to wither in terms of their practical application.

Adameiecki's principles did survive in Polish academia, as universities had slightly more freedom, especially with respect to research (less so in the education aspect and knowledge dissemination) and some of his work was re-published after World War II, but there is not much evidence of the practice of those ideas during the communist rule or today. Nevertheless, although both Taylor's and Adameiecki's work shared similar fates in terms of the practical application of their methods in communist countries, Adameiecki's principles did not receive the same ideological and propaganda-oriented support from the communist leadership as the work of Taylor. Consequently, even if only in theory or in terms of the surrounding controversy, Adameiecki's achievements were overshadowed by the popularity of Taylor.

In summary, Adameiecki's success was impeded by the social and political realities of Eastern Europe in the period of his activity and later during World War II and throughout the communist history of the twentieth century. Taylor conducted his work at roughly the same time, but the USA was a much more fertile ground for the adoption of such ideas because the economic progress and industrial development were unobstructed by political leaders and policymakers aiming at gaining power rather than following economic motives. Even the brief period of socialist support for Taylor rather than Adameiecki may have been motivated by the already prominent stature of Taylor's concepts and thus their latent heavier

psychological impact rather than the practical superiority. An additional reason may have been the potentially wider application of Taylor's ideas, as popularized, for instance, after his death by individuals such as Mary Van Kleeck, which resulted in widespread recognition of the potential of scientific management for improvements in social and economic planning (Alchon, 1992). These supplementary factors are considered further in this study.

After WWI, Adamiecki himself seemed to understand the difficulties he had faced in terms of popularizing his methods under the Russian rule. In a petition written by Adamiecki (1925, p. 11) representing the Committee for Establishing the Institute of Labor Organization in 1925, he states:

Even in Russia numerous research institutes have been established and the Soviet government grasps for scientific management as if it were their last hope. Recognizing its imminent downfall if the efficiency of labor does not increase, the Soviet Government using its terror methods is trying to organize the labor in factories according to scientific rules. These attempts are, of course, ineffective because labor and science cannot stand such aggression, but they are nonetheless significant.

Accomplishments and inventions

The ideas of Adamiecki emerged from a necessity that dominated the industry in the late nineteenth and early twentieth century – the need for a new approach to industrial organization resulting from the general industrialization of the economy. The same necessity had served as a motivation for many other scholars throughout the world, especially the USA and Western Europe, devoted to improving efficiency. Factories were emerging and new technologies were being developed, yet management practice lacked the systematic approach to organizing labor and controlling work, performance and output under the new economic conditions. Many engineers concentrated their developmental efforts on the technical side of production but no improvements were made in terms of systematizing the performance in relation to the human involvement in the production process.

Adamiecki, as well as Taylor and many others, recognized this gap in the practice of management and began investigating the causes of output deficiencies despite the new technologies. He thus proceeded to observe the operations at certain workstations and register the times and durations of each movement to eliminate the unnecessary parts of the job.

Adamiecki initiated his research in 1895 by experimenting with operations in the plate steel mill and developed new methods in technological processes. His work, however, faced resistance from workers and technicians, which forced him to conduct his research more carefully and more covertly, so as not to draw attention. He managed to construct graphic production schedules and use them to prove that the losses of time and labor in factories had occurred due to stoppage and idleness of labor (Wesolowski, 1978). Later, he was presented with unfavorable judgments on the part foreign factory bosses related to blaming the Polish workers for low productivity. The accusations were serious and hurt both the professional aspect of Adamiecki's (1925) work, as well as his patriotic feelings.

In light of such accusations, Adamiecki began to quietly observe a group of 16 Polish workers. He measured and registered the times of each operation they performed, focusing on the duration of particular movements and the length of

pauses. Based on those observations, he created *harmonographs*, which indicated that the cause of low productivity was the lack of harmony and coordination of consecutive operations in the process. [Adamięcki \(1924\)](#) further conducted this stream of research in Ekaterinoslaw, Russia, where he eventually presented his work in 1903 in the paper entitled *Principles of organized labor* describing his *Theory of Harmonization*.

In 1908, Adamięcki gave a lecture at the Association of Polish Technicians in Warsaw, Poland, which was largely a repetition of his 1903 presentation in Ekaterinoslaw. After this lecture, he was able to implement his ideas on a broader scale. He applied his ideas in the masonry and concrete and ceramic industries, as well as in steel mills across Poland. His way of treating jobs with specific detailed attention became popular as the factories realized that Adamięcki's methods of eliminating time losses and improving efficiency due to the use of harmonographs increased productivity by 100-400 per cent. His concepts were therefore further accepted by the mining, textile and railroad industries. They also found application in agriculture practices and civil service organizations.

In his later and probably most significant publication – *The Harmonograph*, [Adamięcki \(1931b\)](#) identified the various causes and consequences of low productivity and once again summarized them. The main reasons for productivity losses were as follows: underutilization of machinery – resulting from frequent downtime of machines, which, in turn, resulted from the lack of coordination of output of particular segments of the production process (lack of *harmonization*) – which could be remedied by a careful analysis, planning and designing of the production process with regard to particular segments of the production line prior to deciding on specific methods of production and ordering the machinery and raw materials. His conclusion was that great amounts of capital were lost in many industries due to the lack of adequate planning and organization of the production processes ([Adamięcki, 1931b](#)).

Time and motion study

Motion study constituted the background for investigating the work-flow problems. Some authors note that such problems, as well as the motion approach, were not specific to management, but rather a way of perceiving the world in general ([Reeves et al., 2001](#)). The new way of resolving the organizational problems at the end of the nineteenth and beginning of the twentieth century was a reflection of the emergence of the new paradigm of knowledge development, where a complex situation or problem is taken apart into the smallest possible components, investigated, measured and reassembled in a way that allows for better understanding and identification of plausible solutions. [Reeves et al. \(2001, p. 137\)](#) make the following statement in support of this view:

In management, Lillian Gilbreth's concept of analysis and synthesis, Frank Gilbreth's motion study, Adamięcki's harmonographs, and Day's network models and decision trees best illustrated this changing paradigm.

[Adamięcki \(1909, p. 63\)](#) described his interest in time and motion studies, as well as the necessity and the usefulness of considering time as the cost factor, in his paper entitled *A Graphic Method of Organizing Collective Work in Rolling Mills*:

The weak sense and low consideration of time is most directly visible in the field of work organization. It is essentially a framework into which organization is incorporated. From here, however, it transpires directly into our construction and installation effort; very often we encounter basic mistakes proving that the designer showed little consideration to the principle that the time-loss in the mechanisms and equipment itself should be minimized.

For the purposes of investigating the time and motion issues, Adamiecki developed a method of *chronometraż* (Kozminski and Piotrowski, 2005), meaning: *chronometric measurement*, which loosely translates into the term *time study*. The chronometric measurement method consists of three stages:

- (1) Preparation of study, including selection of worker after a series of interviews and after investigating their work station and the principles of the technological process; division of the actions into fragments – the fragments must start and end at precisely established moments and the time separating the fragments is the point where the stopwatch is halted and the time value is read (Adamiecki also pointed out that the number of sample units – measurements necessary to obtain representative data – should be established using probability calculations, as well as statistical and mathematical methods).
- (2) Observation and measurement: at this stage, fragments of the worker's actions are measured using a stopwatch and the results documented on various charts (including the chronometric chart which includes the results of the measurements and mean values of the measured fragments, the norm chart with standards for each fragment, etc.). The results are then compared to the standards set for the particular fragment of the job.
- (3) Evaluation of results. The process fragment measurements are called the “chronometric row”; mean values are calculated for each fragment and those that deviate significantly from the mean are eliminated (Lisinski *et al.*, 1985; Kozminski and Piotrowski, 2005).

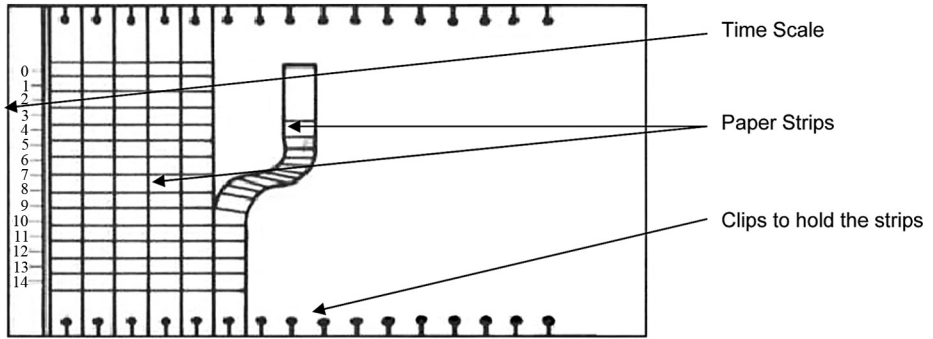
Although created in distant parts of the world characterized by varying economic and social conditions, the work of Adamiecki exhibits similarities to the ideas developed by Frederick Taylor and other contributors to scientific management both in terms of the methodologies used and the conclusions reached. Adamiecki, however, went on to create numerous mechanical devices, equipment and tools designed to facilitate the scheduling, implementation and control of the work-flow in factories. The most prominent of these inventions was the *harmonograph*.

The harmonograph

The time study method developed and used by Adamiecki led to the creation of what he received most credit for – the *harmonograph*[3] (in his original work, Adamiecki uses the Polish spelling: *harmonograf*) (Adamiecki, 1931b). The harmonograph was a table with paper strips which one could remove from the main sheet. An example of a harmonograph is illustrated in Figure 1 and a single strip of paper is shown in Figure 2.

Each operation in the process had a corresponding paper strip and each of them was labeled accordingly. Time was marked on each strip as horizontal lines defining time

Figure 1.
Adamiecki's
Harmonograph



Source: Marsh (1975)

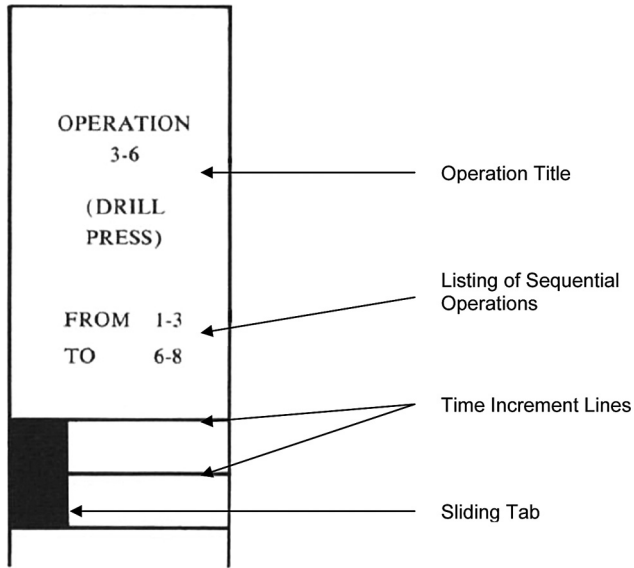


Figure 2.
Adamiecki's
Harmonograph:
single paper strip

Source: Marsh (1975)

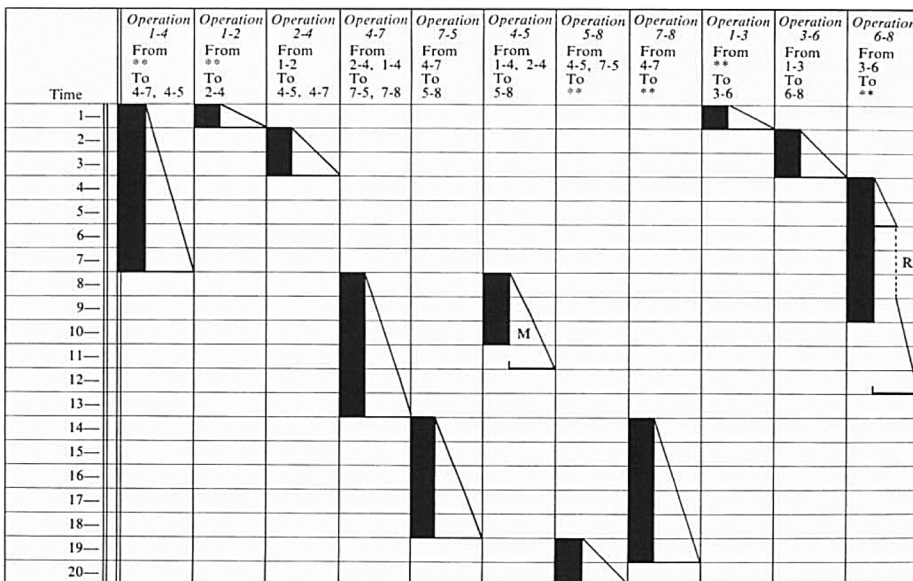
units that followed the downward pattern from 0 to whatever number of units was required. Another element of the harmonograph was the sliding tab placed on the side of each paper strip, which corresponded in length to the number of time units necessary to complete a certain operation. Also indicated on the paper strip were the operations directly neighboring the one indicated on the particular strip. It would indicate the operations directly preceding and directly following the operation on the strip. An important part of the work was to prepare the harmonograph itself. It was crucial to identify each operation in the technological process and establish what the adjacent fragments were to build the harmonograph properly. When this stage was finished, the course of optimizing the production process was a facile matter of sliding the tabs along

the side of the strips and switching the strips around to reach the most efficient arrangement. An example of a full harmonograph with a harmonograph of the time distribution of particular operations is shown in Figure 3.

In his original work, Adameiecki provides instructions on how to properly use the harmonograph. One of the important components of the original paper is the description of how to actually make a harmonograph. Noteworthy is the level of detail in Adameiecki's (1931b, pp. 266-267) explanation of the various elements of the device, including specifications of the materials to be used:

The main principle of the harmonograph is that the surface, on which the harmonogram is assembled is not a single indivisible sheet, but is composed of several strips of paper, laid vertically next to each other. These strips are fixed at both ends to a wooden board using clips, so that each strip can be inserted or removed independently of the others. On the left edge of the strip, narrow tabs are placed made of thin tin sheets or colored celluloid, which serve the function of time lines [...]. The tab has a folded shape in such a way that both its edges press against each other and thus hold the edge of the paper. The strength of the hold, however, is not excessively high, so that pressing on the end of the tab allows for it to be shifted along the paper strip[4].

Numerous modifications of the harmonograph exist both in the history of management thought and in today's practice. The version that resembled Adameiecki's invention was the Gantt chart, which received broad attention and became widely used and known as some of the most important early graphical aids to management. Some authors argue, however, that Adameiecki's harmonograph had several advantages over Gantt charts and was therefore superior in importance.



Source: Marsh (1975)

Figure 3. Adameiecki's Harmonograph: Harmonograph table with paper strips and marked timelines

Marsh (1975), for instance, identifies three such advantages. He states that: “the harmonogram is superior in the following respects:

- (1) It indicates the critical path and the amount of slack in the noncritical operations.
- (2) It can be updated easily by sliding tabs and, if necessary, relocating the paper strips.
- (3) It reduces the solution of even very complicated projects to a mechanical shifting of tabs” (Marsh, 1975, p. 361).

As noted in previous studies, it is remarkable that this technique of managing production processes by using graphical diagrams was used in Poland as early as 1896 (Marsh, 1975). Adamiecki proceeded to summarize, structure and generalize his technique into more advanced theories, such as the *Theory of Labor Harmonization*.

The Theory of Labor Harmonization

The economic situation and the global need for a new approach to management and management research resulted in the expansion of topics to include the development of new salary systems, methods of worker selection, improvement of production processes and the overall structures of industrial organizations (Adamiecki, 1985). An important factor also became the incorporation of scientific methods in management research. It was crucial to systematize the research methods to better understand the complex character of emerging industrial economies with large factories and their intricate structures. The focus turned to defining the science of organizations, laws that governed their structure, the social implications of implementing scientific methods of management, as well as the human factor and issues deriving from it during exercising the scientific approach to organization (Wesolowski, 1978). Adamiecki hypothesized that if the relation of particular fragments of the production process to each other is characterized by harmony, the losses in labor and productivity would decrease. Although the losses are inevitable due to various reasons, such as the human factor, machinery issues and thus instigate limitations to perfect organization – under the conditions of harmony, irregular processes will stand out and will be easier to correct or eliminate.

This *Law of Harmony* was discussed by Adamiecki (1924) in his 1924 paper *Harmonization as one of the main principles of scientific organization* in which he states that when labor is divided between several elements that are supposed to work together, the economic result is improved. Thus, these cooperating elements are also advanced and better attuned with each other. The appropriate selection of the elements should, therefore, be based on their economic characteristics, as defined by the law of growing production. Adamiecki (1924) also argued that when multiple elements cooperate in harmony, the economic results progress proportionally to the exact timing between the work of particular elements.

To ensure better understanding of the harmonization principles, Adamiecki (1924) makes a comparison to music and basic principles of composing. In his own words:

A complete analogy [of the method of collective work harmonization] with music is visible, not only in terms of the selection of harmonic sounds according to the tone and strength,

but also their placement in time [...] and further “While performing a musical piece, the principle is for each sound to be played in its time, no earlier and no later” (Adamiecki, 1985, pp. 166-167)[5].

What evolved from Adamiecki’s ideas of harmonization, he later used to formulate a number of laws concerning, among other issues, the process of production itself. Adamiecki created the following laws of production:

- the law of energy cost and production means;
- the law of optimal benefits; and
- the law of economic management (utilization of all factors of the production process, such as labor, energy, machinery, raw materials and production time).

He further stated that the science of organization and management, as any other discipline, was based on a set of laws, which he identified as follows:

- *The law of growing production*: Productivity increases due to capital and labor investments, the unit cost decreases to a critical value below which no further investment is necessary.
- *The law of division of labor*: Output increases when labor includes several productive functions that are repeated due to the fact that the organization will decrease the amount of labor necessary to achieve the standards.
- *The law of concentration*: The amount of necessary labor will decrease if two or more similar elements of the production process are grouped or replaced by a larger element with the same productive potential.
- *The law of harmony*: The precision of selection of the elements performing the divided labor (harmonization) depends on the maximum possible equalization of task times; and the utility of the process is determined by the least efficient element (Adamiecki, 1924).

Similarities between the work and ideas of Karol Adamiecki, Frederick Taylor, Henry Gantt and other contributors to scientific management reach such an extent that the terminology they had used, when loosely translated, was identical. Terms such as *division of labor*, *scientific organization* or *time study* have been used simultaneously by these scholars, albeit in different languages. Yet, they conducted their research independently and, according to Wesolowski (1978), Adamiecki was unaware of Taylor’s work until the early 1920s.

Thus, the aim of the following discussion is to investigate the reasons why less attention has been given to other contributors, whose work, ideas and findings bear comparable significance to the work of Taylor and his followers. Has there been a bias in management education and could it have been influenced so forcefully by the opinion of the “fashion setters”, as referred to by Abrahamson (1996), that it failed to acknowledge the work of individuals other than those “traditionally” accepted? Or is accepting some individuals as pioneers of the discipline while failing to recognize the achievements and contributions of others a result of a true academic consensus based on a conclusion that the work of some is indeed of lower quality, and thus less importance? The above reflection on some of the achievements of Karol Adamiecki shows that the ideas of both scholars shared similarities and thus had equal

potential to gain wide acclaim. Yet, the question remains, why similar ideas developed by individuals in distant parts of the world receive varying degrees of attention and consequent recognition. Why do some individuals receive more credit than others and are thus considered precursors of certain movements or disciplines? As mentioned in the beginning, there are several approaches to considering the level of adoption of ideas specific to the field of management.

Research adoption, dissemination and popularity

Considerable research exists regarding the transience (or longevity) of ideas and the various levels and facets at which this issue may be analyzed. Huczynski (1993) considers individuals and individual ideas vs groups and economic and social systems. Others examine diffusion channels, such as gurus (Jackson, 2001), media (Furusten, 1999), business schools and universities (Sturdy and Gabriel, 2000) or professional organizations (Robertson *et al.*, 1996), to mention a few. Some researchers talk of processes, such as hybridization of ideas (Botti, 1998), Americanization (Djelic, 1998) and others. However, with respect to the specificity of adoption of *management* concepts, Sturdy (2004) identifies six overarching contextual perspectives: rational, psychodynamic, dramaturgical, political, cultural and institutional.

According to the *rational perspective*, ideas are adopted because they work or promise to do so. This view is mostly associated with individuals and their vision of the most appropriate methods (Sturdy, 2004). However, in regulated environments (in the case of Adamiecki – the Soviet dominance and later the socialist reality and regulated economies of USSR and Eastern Europe through the majority of the 20th century), such ideas may become mandatory or institutionalized (Sturdy, 2004). As described earlier, for political reasons, Taylor's ideas may have been more appealing to the revolutionary leadership in Russia, including Lenin's interest in scientific management, but eventually, it was the command economies and the government prescribed methodologies and approaches that left no room for practical adaptation of Adamiecki's ideas, especially on the individual manager level.

The *psychodynamic view* focuses on the anxieties and yearnings and the corresponding need for a potentially comforting sense of order and control. For instance, some managers may simply desire to be seen as using a particular method, and scholars may seek recognition as engaging actively in a specific area of research (likely before or at the same time as everyone else). It is often associated with ideas adopted without consideration of effectiveness, and soon discarded, as they fail to satisfy the need for security and order, or are simply ineffective. In a later section, described are certain aspects of the academia in the USA which may have been influenced by professors seeking legitimacy and security within the scientific field through their endorsement of scientific management and Taylor (Nelson, 1992a).

By contrast to the rational and psychodynamic perspectives, which focus on managerial demands for solutions or identity/security, the *dramaturgical (or rhetoric) context* concentrates on the persuasive power of agents (gurus, consultants, academics, trainers and authors), their charisma and presentation, often based on source credibility, emotional appeal and logical proof (Huczynski, 1993). Ideas in this view are associated with different types of benefit (universal, organizational and personal), but it fails to take into account broader issues of power

or the immediate cultural context, both of which may have contributed to the popularity of Taylor vs Adamiecki in different parts of the world. Nevertheless, some aspects of this context were of significance – such as, previously addressed, Lenin’s rhetoric which tried to capture the tenets of Taylor’s methods for the benefit of the Soviet revolutionary propaganda (Wren and Bedeian, 2004).

The *political view* refers to the instrumental use of ideas to secure power (Bendix, 1956). Power seems to have been the driving force behind scientific management falling in and out of favor in Eastern Europe and under the Soviet regime. The political premises, however, also played a role in the wide adoption of Taylor’s ideas in the USA, including in the academic circles. Thus, these aspects deserve a more detailed consideration, which follows in subsequent sections.

The *cultural context* considers locally embedded nature of knowledge such that culture acts as a bridge or a barrier to transfer of ideas (Sturdy, 2004). With respect to the content of this study, literature points to the fact that although there is certainly a connection between culture and the content of the ideas (although in this case, as the ideas of Taylor and Adamiecki were so similar, it shows that there was a similar need in both the USA and Eastern Europe for improved efficiency), the more viable factor may have been the “resonance” of the idea among the interested parties, or sometimes even its origin. Smith and Meiksins (1995) describe, for example, a “dominance effect”, whereby, in certain contexts, ideas are attractive precisely because they are foreign or specifically Japanese, American or Western.

Finally, a factor that impacted the adoption of Taylor’s ideas to such a greater extent than those of Adamiecki may have been a fertile ground prepared by the various institutions that had a potential interest in scientific management methods but varied in terms of their prominence, influence and ways to disseminate knowledge, such as engineering groups, government and others. This *institutional context* (Sturdy, 2004) and the specific impact of the above groups is also addressed in later paragraphs.

As discussed earlier, the differences in the socio-political circumstances, in which Adamiecki and Taylor and his followers constructed their research, such as direct exposure to the hardships of WWI and the earlier Russian dominance in Poland, which may have played an important role in influencing the degree to which their accomplishments and ideas were disseminated and adopted as standards in the drive toward efficiency. Beyond those factors, however, several other conditions may have existed that determined Taylor’s success as compared to Adamiecki.

The comprehensive approach

Adamiecki and Taylor seemed to have had the same initial fascination with the study of labor that motivated them to pursue the practical approach to research in improving efficiency. In their early writings, both scholars focused on solving specific efficiency problems caused by failure to eliminate unnecessary movements or lack of optimization of the workspace, among other factors. Both have also eventually revised their writing and enhanced their advocacy of the more wholesome approach to organization in general and organization of labor in particular. While Adamiecki’s approach was based on solving specific efficiency problems, later in his career, he began translating his efficiency ideology to more general applications. His 1924 article on harmonization as one of the main principles

of scientific organization was an expansion of his methodology into broader application possibilities and a demonstration of its evolution into a new way of thinking about organizational problems (Adamiecki, 1924).

Adamiecki's pursuit of the wholesome approach to organization using his scientific methods may have been, at least in part, stimulated by his frustration with the continued lack of efficiency in Poland after WWI, despite his efforts to popularize his methods – as evidenced in the very direct tone of his report written in 1925 on behalf of the organizing committee of the Institute of Labor Organization, petitioning for support for the foundation of the above institute:

Analyzing the intricate knot of causes of the miserable economic state of our country, the high prices and the heavy financial situation, we always reach the same fundamental cause: the immeasurably bad condition of our labor [...]. the low efficiency of labor is a disease that consumes all levels of our society, from an employee performing intellectual work to one performing physical labor (Adamiecki, 1925, p. 3).

Taylor's motivation may have had other premises. In Taylor's case, the drive toward developing a philosophy of scientific management was also a defense against criticisms and prosecution that came about largely as a result of piecemeal applications of his ideas and the association of scientific management with hostility toward labor unions (Nelson, 1992b). Thus, Taylor began to identify scientific management not with solutions to particular organizational issues, but rather with a "mental revolution on the part of the workingman", so that his ideology could be seen as a system rather than a series of isolated solutions. Consequently, scientific management became both a detailed plan for improving operations of a plant or an office and a system of prescriptions for improving any activity.

The paths taken by Adamiecki and Taylor are therefore parallel with regard to the evolution of their thinking about the science of organization – from solutions to specific problems to expansion into larger wholesome philosophies. Taylor's methods, which usually are depicted as authoritarian, inconsiderate of the human factor and generally standing in stark contrast to Mayo and others' work at Hawthorne, have recently been re-evaluated to find that, in fact, his writings included a considerable amount of suggestions anticipating the socially oriented changes recommended by Mayo or even Maslow (Schachter, 1989).

Taylor turned to this new way of thinking about scientific management also to emphasize something he had realized in the process of his research – that successful management depended on ideas that could be applied to many different kinds of organizations (Nelson, 1992b). Adamiecki also addressed the broader application of his ideas, especially in his *harmony of spirit* principle where he urged organizations to work together as a unit and create a system of shared values. Although Adamiecki sought to broaden his methods to numerous organizations and translate them into philosophies aimed at pleading the policymakers to promote scientific management and thus remedy efficiency issues, his specific methods were mainly focused on factories. What may have given Taylor an advantage was the fact that he had experiences in a variety of industrial enterprises (Nelson, 1980). Although he developed his methodology from research conducted in factories, he and his followers worked vigorously to promote the application of scientific methods in numerous other types of organizational settings, which provided for a more universal nature of Taylor's ideas.

Universality of the idea

Taylor, especially after the publication of his *Principles of Scientific Management*, became somewhat of a “household word”, and the scholar himself had to sacrifice research work for the sake of public appearances, lectures and visits (Nelson, 1980). As his role in the management movement consequently declined, he turned to others for assistance. As a result, numerous followers worked actively to popularize Taylor’s ideas in a variety of organizational settings and find applications of scientific management in other fields.

Nelson (1980) reflects on the application of scientific management in stores and offices, where clerical work has become labor-intensive and relied to a great extent on small machinery which was hand-operated. This setting provided a fertile ground for seeking efficiency improvements aimed at the individual worker. Noteworthy was the lack of controversy in applying Taylor’s ideas in such settings, as opposed to the difficulties encountered in large factories. Eventually, applications of scientific management in these settings were associated with mechanization of clerical operations and with the growth of the female work force – an achievement which, from a social point of view, was significant and gave Taylor’s ideas a very positive image.

Numerous authors consistently state that Taylor’s ideas are not limited to the field of management but are also applicable in a variety of functional disciplines of business, even in the twenty-first century. Recently, Kulesza *et al.* (2011) examined the influence of Taylor’s principles on modern accounting systems. Salimath and Jones (2011) described the parallels between scientific management principles and the concepts of bricolage and bootstrapping in entrepreneurial firms. The authors concluded that Taylor’s efficiency principles can be successfully utilized in entrepreneurial and small businesses and point to an emerging field of *scientific entrepreneurial management*.

Furthermore, Nelson (1992a) brings up the uproar that occurred after *Principles of Scientific Management* had been published in 1911, that pointed to the applicability and appeal of Taylor’s ideas in further non-industrial settings, such as social welfare agencies and public school systems. In fact, it was the interest of the universities and academic spheres, along with the popularity of Taylor in engineering circles, that provided fruitful communication channels and thus additional advantages in terms of the later recognition of his ideas as compared to those of Adamiecki.

Support and communication

Academic circles and the rise of business education

According to the political view of contexts in which ideas gain prominence (Sturdy, 2004), which ideas get promoted depends largely on who has control of the means of dissemination (Bendix, 1956). In the USA and Western Europe, the power was on the side of the industrialists, professionals and academics (Sturdy, 2004). Taylor was able to find ways to appeal to all these interest groups, and throughout the century, these circles were able to use Taylor’s philosophy as a whole, or particular bits of his ideas for their individual purposes. Under the democratic political regimes and free market conditions, the interests of these groups were driven by genuine desires for efficiency unobstructed by political goals and thus flourished in the rational context,

where ideas are adopted because they prescribe methods or procedures that simply work or are expected to work (Burns and Wholey, 1993). In Russia and Eastern Europe, however, as discussed earlier, the advocacy and further dismissal of Taylor's ideas (i.e. Lenin's sudden change in views on Taylor) was politically driven. The dismissal of Taylor by Stalin and his regime may have simply carried over to include any and all of the scientific management proponents, including Adamiecki.

Moreover, some of the prime vessels for Taylor's ideas were universities, where academicians' interest in the principles of scientific management was rising. Business school professors were attracted to Taylor's ideas because of the implications for the practical curriculum. Academicians wanted to improve their relations with colleagues from more rigorous disciplines (Nelson, 1992a). Schachter (2010) points to the significant role that Taylor's achievements played in the development of the first-generation academic management programs. Adaptation of Taylor's work into the practical curriculum of business schools grew as professors became some of the key students and interpreters of his ideas. In other words, in American business schools, the adoption of scientific management provided legitimacy for business as a rigorous scientific discipline.

College business education began with The Wharton School of the University of Pennsylvania (founded in 1881 and remained the sole university college of commerce for over a decade) and increased to seven university institutions offering business programs by 1900. In the post-WWI period alone, by 1924, there were 117 new business programs created. By the late 1920s, there were more than 6,000 business degrees awarded per year. The role of scientific management in the rapid growth of university business education and the scientific character of business curricula that scientific management endorsed is significant and constitutes the prime reason behind the popularity of Taylor's ideas among the academic circles in the beginning of the 20th century.

It is significant primarily because business education was, in fact, initiated in the USA, both at the undergraduate and the graduate levels. The first institution to offer graduate education was the Tuck School of Business at Dartmouth College in 1900, while the first MBA program in Europe was offered by the French INSEAD (Institut Européen d'Administration des Affaires) as late as 1957. Undergraduate business education began in Europe earlier, but still much later than formal business education in the USA. European business programs were therefore largely based on the American models, and the curricula were based on the experiences of American colleges. Thus, the dominance of Taylor's ideas was transferred to European business education, consequently, overshadowing other contributions to scientific management.

Adding to this popularity was the fact that universities in the USA not only introduced courses in areas such as factory operations but also promoted concepts of executive activity based on scientific management that spanned beyond production, thus underlining the much wider applicability of Taylor's ideas. This trend continued and was especially prominent during the time of Gilbreth's activity, as well as that of Richard A. Feiss, when scientific management attracted a wide interest in the intellectual circles in America. Even in the 1920s and 1930s, a large share of the management movement included university professors, who viewed scientific management in terms of academic politics, but their efforts to exploit it for

such purposes provided an unplanned and unanticipated vessel for the popularization of Taylor's ideas. What followed was the creation of courses based on management principles in non-factory and non-engineering areas, such as marketing, which was the fastest growing specialty in the post-war era (Nelson, 1992a).

In summary, in terms of the university business education, authors identify several changes in connection with the rise of scientific management:

- it became a central feature in the practical curriculum of the university business programs;
- because of its stricter quantitative character along with the wider practical applications, business professors gained a more prominent and secure role both at the university level among more strict disciplines and in the business community; and
- a large percentage of business and engineering students were presented with the tenets developed by Taylor and his followers in their curricula (Nelson, 1992a).

In comparison, Adamiecki was active in Poland with regard to promoting his work in the engineering circles and later continued to frame it in terms of labor organization, but his contribution to business and management education did not find a comparatively fertile ground. As a result, his recognition was substantial in local and even some international European societies, but those were mainly embedded in the engineering profession. Only later in his career has he turned to applications of his ideas in wider organizational contexts. Those efforts, as well as the majority of his educational activity were, however, concentrated in technical universities focused on optimizing production.

Engineering circles

The institutional context may determine different levels of adoption of ideas with respect to a variety of factors. Guillen (1994) compared the spread of scientific management historically in different countries and observed differences in terms of the adoption of Taylor's ideas according to factors such as time, sequence, region, country, sector, field and other criteria. While specific problems are, in fact, experienced by managers, paradoxically the adoption of ideas is shaped by institutional factors, such as the mentality of local business elites, professional and educational groups and government bodies, as well as employee reactions and industrial relations (Alvarez, 1996; Abrahamson and Rosenkopf, 1997).

One of the important enterprises, with which Taylor became associated, that were shaping the industrial environment at the time was the rapidly maturing engineering profession (Nelson, 1992b). Engineers emphasized formal education, standards of behavior and even issues such as social responsibility. Empiricism of the practitioners was rejected in factory settings, while scientific experimentation and analysis were favored. Yet another faction that Taylor followed and became associated with was the *systematic management movement*, which was an endeavor among engineers at the time of Taylor's activity to institute administrative systems in place of the informal methodology of industrial management that was plaguing the factories. Nelson (1992b, p. 7) calls it a "rebellion against tradition, empiricism and the assumption that common sense, personal relationships and craft knowledge

were sufficient to run a small factory". What may have, therefore, facilitated the popularization of Taylor's ideas was the fact that, in a sense, he had joined a new but already moving bandwagon of engineering and management trends and thus further proposed and optimized the systematic management methods. According to Nelson (1992b) Taylor thus fashioned scientific management from systematic management. There were, however, further important differences in the contexts in which Adamiecki and Taylor popularized their ideas.

Taylor's following

Adamiecki, during his research in Polish and Russian factories, had colleagues who assisted him in his experiments. Even so, he never reached the level of following that Taylor has enjoyed that would escalate to such a level of support, even post-mortem.

It is difficult to find records of Adamiecki's followers continuing his work. This may be largely due to the fact that although there were numerous factories throughout Poland where he introduced his methodologies, as well as several organizations which he had founded with the purpose of promoting the scientific approach to labor organization, almost all of these institutions ceased to exist or were destroyed during World War II. In comparison, as mentioned earlier, Taylor's work became so popular that he had to spend more time on lectures and public appearances and thus turned to others to assist him.

As an example, in 1910, Louis Brandeis, a lawyer and reformer, used the testimony of Taylor's followers and employees in the Eastern Rate Case before the Interstate Commerce Commission to publicize scientific management. By the time Taylor was testifying before the Congressional committee, he had a number of people already prepared to apply his principles in the industry and to explain the tenets of scientific management to the public. Among others were Henry L. Gantt and Morris L. Cooke, Frank B. Gilbreth, Harrington Emerson or Harlow S. Person (who was crucial in the scientific management movement after Taylor's death) (Nelson, 1975). Those people's specific contributions are beyond the scope of this study, but they played a crucial role in the popularization of Taylor's work – a tremendous disseminating force that Adamiecki simply did not have available. For instance, between 1901 and 1915, Taylor's associates (not Taylor himself) introduced scientific management in almost 200 American businesses (Nelson, 1975). They were two major categories of businesses:

- (1) factories (textile mills, automobile plants, etc.) that sought efficiency (reduce delays, bottlenecks, increase output per unit of time and so on); and
- (2) innovative firms, mostly small businesses, which were already committed to managerial reform and whose executives were drawn to Taylor's promise of social harmony and improved working conditions.

As opposed to the factories and institutions that utilized Adamiecki's methods in Poland, these American businesses were not directly subject to the hardships of the two World Wars and many were still in existence throughout the twentieth century.

As the publication of *Principles* resulted in an "efficiency craze", Taylor, Gilbreth, Emerson and others became celebrities. Numerous publications followed devoted to efficiency and the professional organizations and societies recognized the importance of management and universities began to teach management, and efficiency enhancement

became the motto in virtually every organization. The above, together with Taylor's death in 1915, marked the new phase in management history. Engineering circles formally endorsed collective bargaining and Taylor's followers reconciled with union leaders. This removed a main source of misunderstanding and demonstrated the appeal of scientific management among union leaders. The movement embraced personnel reforms and merged with personnel management movements. As a result, personnel departments were created which performed duties formerly assigned to foremen (hiring, firing, training, etc.) (Nelson, 1975). Thus, yet another barrier to Taylor's popularity and acceptance had been removed.

In addition, scientific management gained popularity within the federal government. Taylor did not have favorable relations with the Taft administration and his followers did not have much dialog with the Wilson administration. Wars brought about new needs for efficiency and productivity, and when Hoover rose to power, he was the first to seek the aid of scientific management. He became such an avid advocate of Taylor's methods that he soon surpassed Taylor himself as the main advocate of efficiency (Nelson, 1992b).

Communication styles

Finally, it is worth mentioning that there was another aspect of Adamięcki's and Taylor's work that may have had an impact on the level of adoption of their ideas. The anecdotic sentence by Albert Einstein: "Make it simple, but not too simple" suggests that for one's thoughts to be understood and properly interpreted and adopted, one must first decide what to retain and what to leave out of the message, and second – express them in such terms that capture the quintessence of the idea but use contexts with which the receiver of the message can identify and which can be comprehended. It seems that both scholars, at least in their later writings, understood this principle and adjusted their language accordingly. Specifically, both Taylor and Adamięcki moved away from the technical language and adopted a more common approach.

The difference, however, lies in the fact that while Taylor began to rely more on anecdotes and stories from his own career ("object lessons") to convey his message to audiences that were not interested or simply did not understand the technical language (Wrege and Stotka, 1978), Adamięcki (1931c, 1931a) turned to a more persuasive tone aimed at the authorities and decision-makers to show that the scientific approach to labor organization was the necessary solution to the efficiency problems at the time. In Adamięcki's case, this transition within the style of writing had a similar background as was exemplified earlier with regard to the adoption of a more wholesome philosophical approach, namely, the frustrations with the inefficiencies in factories and the reluctance of the government to pay closer attention to the new methodologies developed both domestically and in some of the most industrialized nations in the world. Yet again, Taylor's motives may have been different.

In reality, Taylor was disappointed with the initial response to his methods and ideas. Industrialists were more interested in solutions to specific problems rather than a broader concept of management, and the scientific management movement and the American Federation of Labor became enemies, while Taylor himself became a figure in a public controversy (Wrege and Stotka, 1978). He therefore

started to speak less about factory operations and more about the general applicability of his ideas – a process that resulted in writing a sequel to his *Shop Management* that eventually became the *Principles of Scientific Management* in which he used colorful stories and language to “illuminate” the principles rather than describe technical details of increasing efficiency through optimizing specific operations. He began using such phrases as “complete mental revolution” and emphasized the broad applicability of scientific management. Thus, while *Shop Management* had reached the audience of engineers and industrialists, *Principles of Scientific Management* potentially appealed to everyone (Wrege and Stotka, 1978).

In summary, although some authors acknowledge the contribution of Adamięcki to the emergence and development of scientific management, credit remains largely attributed to Frederick Taylor. Wrege and Hodgetts (2000) recognize that the approach represented by Taylor – scientific and based on research and analysis – was not a new phenomenon and that Adamięcki had contributed greatly by developing the network diagrams to solve problems which Eastern European factories had experienced concerning production processes. However, the authors attribute Taylor’s “success” in terms of the subsequent recognition and appreciation of his work to the fact that he had described the practical application of his scientific management methods for the purposes of cost reduction and creation of workforce prosperity. The authors, however, fail to note that Adamięcki’s work was not limited to strict analytical research of technologies and procedures and that he, in fact, developed numerous recommendations concerning the use of his methods to reduce, for instance, the cost of production. In doing so, Adamięcki (1924) not only concentrated on the cost of time in the process but also recognized other factors contributing to the output deficiencies (overhead, etc.). The above discussion should therefore shed some additional light and clarify the reasons why his ideas did not receive a wide acclaim beyond those identified in literature thus far.

Implications, limitations and future research

In this paper, a discussion of two management contributors, Karol Adamięcki and Frederick Taylor is presented to provide a case example for the deliberations regarding the differences in the level of acclaim of relatively similar ideas and methods. There is, however, an additional question that should be considered in future research while conferring upon the current acknowledgment of historically undermined concepts: what do such differences and the existence of the “forgotten” contributions mean to the shaping of education in general and management education in particular? It is understood that academic generation of knowledge should incorporate as many aspects of theory and practice as virtually possible, so as to ensure credibility and completeness. As Abrahamson (1996) points out, it is crucial to train the future followers of management fashions to better understand the rhetoric of the academic world. He argues that the supply of management fashions is regulated by the consumers who control the corporate and academic world of human resource management, management research and consultancy and should therefore be trained to have a wider range of understanding of the theoretical management nuances. Another conclusion of a more specific scope could be that in terms of academia, the articles published in various countries could provide a clue as

to the existence of management fashion markets and how they correspond to the normative circumstances in a specific country or region.

There are many more examples where similar ideas are developed independently in different parts of the world or even in close geographic, cultural or otherwise contextual proximity. Future research should consider such resembling situations concerning other researchers and whether their contributions were underappreciated by the academic field or were not utilized in practice. Specifically, it is important to acknowledge that Taylor and Adamiecki were not the only scholars and engineers concerned with efficiency and methods typical of scientific management. Future research should survey other movements that proposed efficiency solutions alternative to scientific management. Such explorations could lead to the identification of potential additional causes for their lack of prominence and add to the general discussion of the adoption of ideas.

Second, there is a relationship between the current corporate world events and the major subjects of academic research in management. Further in-depth research is necessary to establish the impact that the underappreciated or under-researched management ideas may have had on the practitioner perception of the validity of certain organizational methods and what route the overall management tendency may have taken if those ideas were popularized. Similarly, sociologists and psychologists, as well as management experts, may find it interesting to evaluate the moral, ethical and practical consequences of unequal appreciation and reference given to researchers and their accomplishment in a variety of fields.

Finally, Adamiecki has published numerous articles during his time in Poland and Russia. The Academy of Economics in Katowice, Poland – one of the best Polish business schools – bears his name. However, a thorough investigation of the Polish literature would add significantly to the comparison of the amount of attention that Taylor and Adamiecki had received in Eastern Europe throughout the decades, both under the communist rule and in the new democracy and free-economy conditions. The set of prescribed textbooks in universities in Poland and other communist bloc countries was significantly different from what is used nowadays. It included a number of publications on management under the conditions of socialist economy. The ideas of Adamiecki, however, are universal enough that they should not be associated with any particular economic or political system. Further research would contribute to the perception of the differences in management education in that region. Additionally, an examination of textbooks used in Polish business schools to teach principles of management would allow to assess the impact of the two scientists on modern management education in that part of the world.

Conclusion

This paper describes the accomplishments of Karol Adamiecki, Polish engineer and scholar, whose research methodology and conclusions were similar to those of Frederick Winslow Taylor. The ideas of both scholars are discussed in the context of various factors which may have contributed to the far greater popularity and recognition of Taylor's work as compared to that of Adamiecki. Those factors include the socio-political realities in which they carried out their research and popularized their ideas, the rational contexts shaping the adoption of their

methodologies and philosophies, institutional support and reception and several others.

In summary, there is a wide-ranging lack of recognition of the contributors beyond Taylor, Fayol, Gantt and other generally acknowledged scholars. In today's world of globalization of virtually every aspect of life, especially the economic environment, it is crucial to understand and recognize the significance of various cultures, including those undergoing rapid changes in economy, such as Eastern Europe, where a large share of international investment is currently directed. As Marsh states, "management scholars should be aware of developments in other countries as well as their own. Additional creative thought and a variety of background cultures may inspire new insights" (Marsh, 1975; p. 363).

Notes

1. Translated by author.
2. This refers to the part of Poland under Russian rule at the time. Under the so-called "3rd Partition" in 1795, Poland was divided between Russia, Prussia and Austria and ceased to exist for 123 years, until the end of WWI.
3. Some scholars mistakenly use the translated term *harmonogram* in relation to Adamiecki's *harmonograph* (in Polish spelled *harmonograf*). In his original paper, *The Harmonograph*, Adamiecki uses both terms: *harmonogram* and *harmonograph*. *Harmonogram* is used to describe the distribution and the scheme of particular tasks and motions in time, while the *harmonograph* is the actual physical device with paper strips denoting this scheme.
4. Translated by author.
5. Translated by author; text in brackets added by author.

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