

Introducing a Method for Reducing Time Loss in Knowledge Work

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Abstract: Time loss and its reduction have been widely studied and practiced in production work, with significant contributions from Taylor's "scientific management" in the USA, activity sampling in the UK, and the comprehensive approach seen with REFA in Germany. Today, the need to improve productivity and efficiency is also recognized in knowledge work (non-algorithmic office work). However, there is limited published research on time loss in this domain. Key factors contributing to time loss include interruptions and challenges related to information search. Consultant publications often highlight problematic emails and meetings as well. We have developed two methods for studying time loss in knowledge work: time studies using a tailored daily diary, and MyTimeLoss®, which involves the daily recording of loss events via loss cards. MyTimeLoss® is based on six (or seven) loss classes, encompassing 53 (or 61) specific loss reasons (or codes). Participants can record loss events using loss cards, available on both office and mobile devices. Both methods are bottom-up, relying on participant judgment, with participants encouraged to suggest actions for addressing identified time losses. Our practical studies, conducted over more than 10 years in several companies and hundreds of teams, demonstrate that time loss in knowledge work can be reduced through focused improvement actions that target the root causes of the biggest time losses. These changes can be implemented as a one-time project or as part of continuous improvement (CI) initiatives. The results are validated through repeated measurements—specifically, the reduction of previously identified time losses—and through feedback from individuals and teams. The benefits to organizations include increased net working time for knowledge workers, leading to various positive business outcomes. Participants also report less frustration, greater empowerment, and improved motivation. We believe it is time to implement large-scale time loss reduction in knowledge work across both the private and public sectors. We conclude the paper by discussing the implications of our approach for knowledge management research and practice.

Keywords: Time loss, Knowledge work, Time study, Loss card, Knowledge management in practice

1. Introduction

Time loss and its reduction have been widely studied and practiced in production work, with significant historical contributions from Taylor's "Scientific management" (Taylor 1911) and Gilbreth's Motion study (Gilbreth 1912) in the USA, Activity sampling in the UK (Tippett 1953), and the comprehensive "Rationalization" approach presented by REFA in Germany. Today, the production development concepts and tools are typically presented the umbrella of Industrial Engineering (IE), for example, the "30 standard methods of IE" (REFA, 2015). The original idea of all these methods was to deploy experts using principles and methods defined and defining the "one best way". However, in our approach, knowledge work is not studied and optimized by an outside expert. The knowledge workers themselves have always an active role in time loss identification as well as in improvements (Figure 1).

	Focus	Method	Role of the worker
Production work	Time loss reduction in physical work	Work study methods (Scientific management & Industrial Engineering)	Being object of the study made by the specialist
Knowledge work	Time loss reduction in knowledge work	Use-of-time study & MyTimeLoss®	Conducting the study of his/her own work

Figure 1: Time loss reduction in production vs. knowledge work

As Peter Drucker summarized, "the most important contribution of management in the 20th century was the fifty-fold increase in the productivity of the manual worker in manufacturing using these methods" (Drucker

1999, p.79). And then he continues setting the new challenge: “The most important contribution management needs to make in the 21st century is similarly to increase the productivity of knowledge work and knowledge workers” (Drucker 1999, p.79).

The term “knowledge worker” was introduced by Peter Drucker in 1959. In a later benchmark article, he refers to “technologists”—i.e., workers performing “both knowledge work *and* manual work”—as “the single biggest group of knowledge workers,” also noting that “they may also be the fastest-growing group” (Drucker 1999, p. 88). His examples include surgeons, nurses, lab technicians, and telecom installers. Other examples he mentions are teachers, salespersons, and computer operators (Drucker, 1999). We share his view on the scope of knowledge work and knowledge workers.

Today, the need to improve productivity and efficiency of white-collar work is becoming widely recognised. However, there is limited published research on time loss in this domain. Especially studies and publications sponsored by office and communication solutions suppliers particularly highlight the harmful role of interruptions (Spira and Goldes 2007). A positive impact of reduced disturbances has also been found in working from a home-office (Van der Meulen, Van Baalen and Van Heck 2012). The losses related to problems in information search appear in reports sponsored by software companies providing solutions for efficient information search (Starmind 2025). Consultant publications often emphasize problematic emails and meetings as well. All these four topics - and many more- are covered by our MyTimeLoss® method.

By *productivity*, we refer to the relationship between the output’s *quantity and quality*, and the knowledge worker’s working time. For an insightful elaboration on productivity in knowledge work see Erne 2011. This relation is typically depending on the level of the methods, processes and tools used. Thus, all *practical improvements* to methods, processes and tools are essential for true productivity development. For example, process improvements suggested by participants in our studies. Another frequent example are tools modifications done by specialists based on specific feedback of knowledge workers.

With *efficiency* we understand the degree to which the knowledge worker can reach the maximum productivity using the current methods and tools available. Typical efficiency loss is happening through various time losses.

Time loss happens whenever the knowledge worker cannot complete her/his professional task according to the planned process or if process/method contains extra or unproductive work that could be reduced with improvement actions. The knowledge worker typically recognises problems and inefficiencies, causing part of the effort being wasted. The work does not flow as it could.

We have encountered consequences of two frequent action lines (among others). Firstly, reducing personnel by merging tasks does not automatically lead to improved efficiency or productivity. In many cases, we have seen the opposite effect. For example, when support or preparation activities are shifted to the remaining knowledge workers, it can cause time loss and a deterioration in efficiency and productivity due to the adaptation of more “casual” ways of working and reducing the quality of output. Secondly, considerable IT investments aimed at significant cost reductions of operations (by increasing productivity) have sometimes failed to meet their targets – even resulting in the opposite outcome. These disappointments could have been avoided by implementing the time loss framework as part of the IT development process.

2. Our two Methods for Studying Time Loss in Knowledge Work

2.1 Use-of-time Study

2.1.1 Idea and background

Since the 1980s, we have used various forms and templates asking knowledge workers to record their use of time on rough level weekly and daily. The target has typically been to identify how much time (or what percentage of nominal capacity) is spent on certain critical activities. For example, how little do engineers in R&D department really make development work and how much technical support and administrative activities.

However, for more than 10 years we have used a more precise tool for daily recording of all kinds of activities during the workday. The need has come through industrial companies facing the challenge to manage their costs while the “fix costs” of white-collar work force have gained proportionally more importance.

2.1.2 Description of the method

First a dedicated *activity list* is compiled covering all work-related activities of the professional group to be studied. This is normally done involving a few experienced group representatives. The activity list differentiates

between *core job activities* and other activities. Core job is defined as the professional work, for which a person has been hired to the company (and the customer is paying for) i.e. the core of her/his creating value. Decision of what to include in core job is done together by management and the group representatives.

The activity list is then set up in a bespoke Excel template. For each working day in the time study every participant describes her/his activities indicating the time used and any time loss observed using one Excel sheet per day. Lunchbreaks, medical appointments, and similar personal time are excluded. Participants are asked to split their daily work to 10-20 different activities.

2.1.3 Conducting a use-of-time study

Proper initial training - including a trial day with personal feedback - has proven essential. It is also important that the participants get information about the purpose of the study and how their personal intimacy is protected. Management commitment and support is essential to communicate. Recognition and celebration of successful loss reduction actions supports the motivation to contribute. Motivated knowledge workers provide highly useful quality responses!

The study periods vary typically between 1-4 weeks and frequent personal feedback during the study has proven to greatly improve the quality of collected data. A period representative of the working year (or other time span) of the professional group is chosen. E.g. for controllers end and beginning of a month.

Results can be analysed using Pareto analysis, distribution diagrams and charts, waterfall diagrams, and other tools to identify the most important improvement opportunities for actions. As consultants we have often helped in the beginning to make these basic analyses. We have also helped to set up lists of action candidates. Team involvement in selecting the actions further improves their commitment to the method and its systematic use. For the management, the availability of quantitative data is important for justifying and allocating resources for improvement projects.

Often, a clever way for an organization has been to begin time studies and improvements with a *pilot group*. Based on the experiences and learning, the approach has then been extended to other groups of knowledge workers.

2.1.4 Results from use-of-time studies

We have been recording for hundreds of teams in various countries the following kinds of values:

- Core job 30-80% of total work time, typically about 60% (non-core activities 20-70 %).
- Time loss 10-40% of total work time typically about 20%.
- Practical improvement suggestions for 10-20% of the time loss registrations.

Thus, often the fully realistic potential to increase share of net working time available for the knowledge worker is concluded 1-1,5 days per week. In many cases this has been reached with either separate projects or continuous (incremental) improvements.

2.2 MyTimeLoss® Method

2.2.1 Idea, background and development

During our consultant work with various organisations, we received suggestions to develop a tool usable with mobile devices for recording time loss events - *Loss cards*. We have also a long history of implementing *War Room* type of *Continuous Improvement* method based on daily recording of loss events as physical loss cards in production environments and expanding to other functions. The loss registration has been working well over many years the longest lifetimes being now close to 15 years. Thus, the idea to develop a tool for "digital loss cards" was born.

2.2.2 Structure of MyTimeLoss®

We analysed all our previous studies (most of which were conducted as use-of-time studies). Classifying the time losses identified we concluded six general *Loss Classes* which can be seen in figure 2. The six loss classes encompass 53 specific *Loss Reasons*, all of which are based on results in our studies. All loss reasons have real life examples based on knowledge workers' time study responses (Figure 3). The basic structure is always the same for all users. However, there are optional Key Words, which can be added for any group and/or organization.

Our ambition is to cover as 7th Loss class the Contact Work. This includes preliminarily in our tool 8 specific loss reasons. Contact Work refers to time losses occurring in contexts such as health care appointments, teaching engagements or issues arising during sales interactions.



Figure 2: Loss Classes

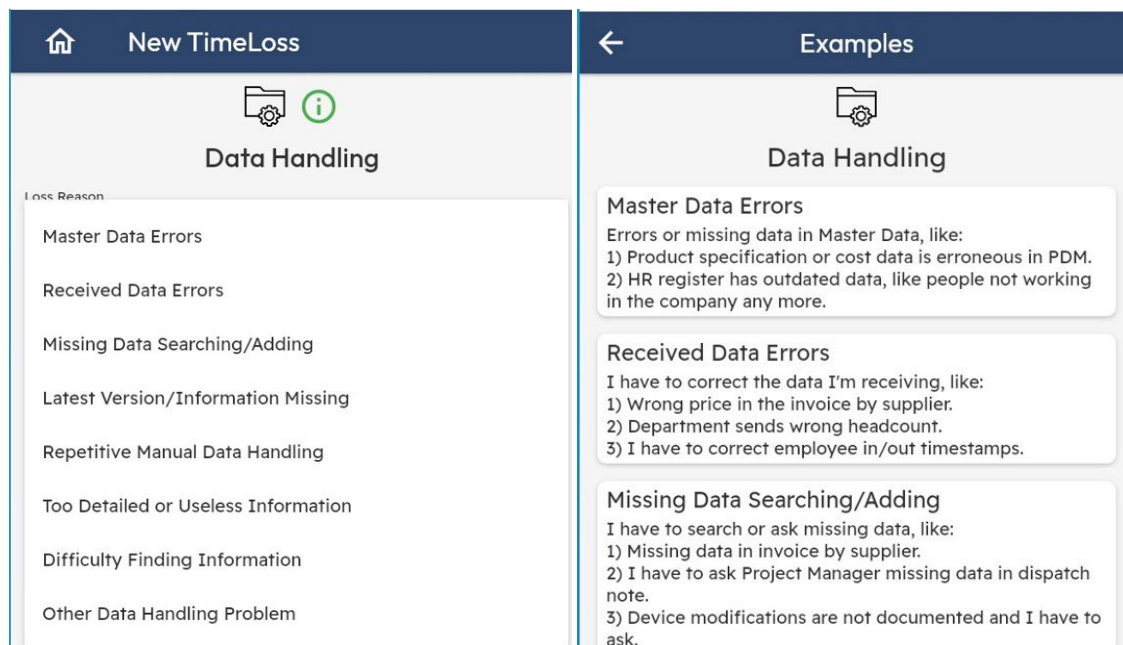


Figure 3: Example of Reason Codes and real-life Examples for Data Handling Loss Class

2.2.3 Using MyTimeLoss®

Like in time studies it is important that MyTimeLoss® users know why it is deployed in the organization. All loss cards are registered with participant names and are visible within the organization. Therefore, respect and trust are essential for superior results – both in loss and action idea registration and implementation of improvements.

Instruction videos are available for tutorials. Some organizations have preferred to use initial training like for use-of-time studies.

It is also possible to use MyTimeLoss® only by an individual for her/his personal job reflection and development.

Knowledge workers register loss events in their daily work either for a specific period(s) or continuously. The registration includes selecting the proper Loss Class and Loss Reason as well as showing the amount of lost time

(Figures 3 and 4). It is also requested to provide a brief description of the loss event and suggest an action for improvement (if on top of the mind). Knowledge workers can also highlight particularly frustrating loss events by marking them with a *Red Flag*. In case the team and/or organization has agreed key words the most appropriate is also selected.

The screenshot shows the 'New TimeLoss' form. At the top, there's a header with a home icon and the title 'New TimeLoss'. Below that, there's a 'Data Handling' section with a folder icon and an information icon. The form contains the following elements:

- Loss Reason:** A dropdown menu with the text 'Please select Reason...'.
- Keyword:** A dropdown menu with the text 'Please select Keyword...'.
- Loss Minutes:** A numeric input field with a red border and a red error message 'Time is requ...'. Below it is a horizontal slider bar.
- Description // Proposal:** A large text area with a red border and a red error message 'Loss description is required'.
- Most frustrating TimeLoss:** A toggle switch that is currently turned on, indicated by a red flag icon.
- Buttons:** 'Cancel' and 'Save' buttons at the bottom.

Figure 4: Time Loss Data input by participants

2.2.4 Optional AI suggestions

MyTimeLoss® has optional AI tool (MyTimeLoss Assistant) for providing comments and suggestions in case the participant wants to use it. The first option for a person is to ask feedback of her/his loss registration activity and coverage of different loss classes. The second option is to ask the assistant suggestions for actions concerning the losses accumulated in Paretos.

At the moment we have noticed that individuals who are familiar with use of AI and use it frequently for other purposes also tend to check at least sporadically AI comments. However also many users do not use the option.

2.2.5 Results from MyTimeLoss® studies

The teams and individuals using the method have provided the following kinds of results:

- Time loss accounted for 10-30% of total work time (somewhat lower than for use-of-time studies, which require more detailed recording of participants' daily activities).
- Practical improvement suggestions were made for 10-70% of registered losses (clearly more than in use-of-time studies).
- "Red flags", which mark particularly frustrating time losses, were attached to 5-25% of registered loss events (not part of the use-of-time study method).

The results show a realistic potential to reduce/eliminate time loss, increasing the net working time available to knowledge workers by 0.5 to over 1 day per week.

For action purposes MyTimeLoss® provides built-in Pareto distributions (Figure 5). The Paretos can be easily viewed based on loss classes or reasons on one hand and on key words on the other hand. Drilling down into the largest loss(es) provides easily sufficient detail for effective action planning (Figure 6). Action ideas recorded on the loss cards can be accessed directly or through separate Excel-based analysis.

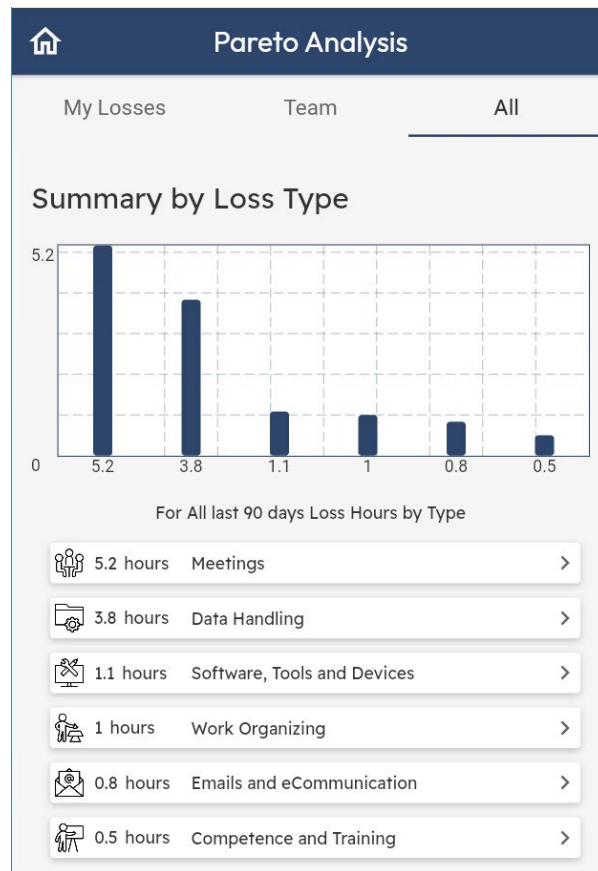


Figure 5: Example of a main Pareto by Loss Classes

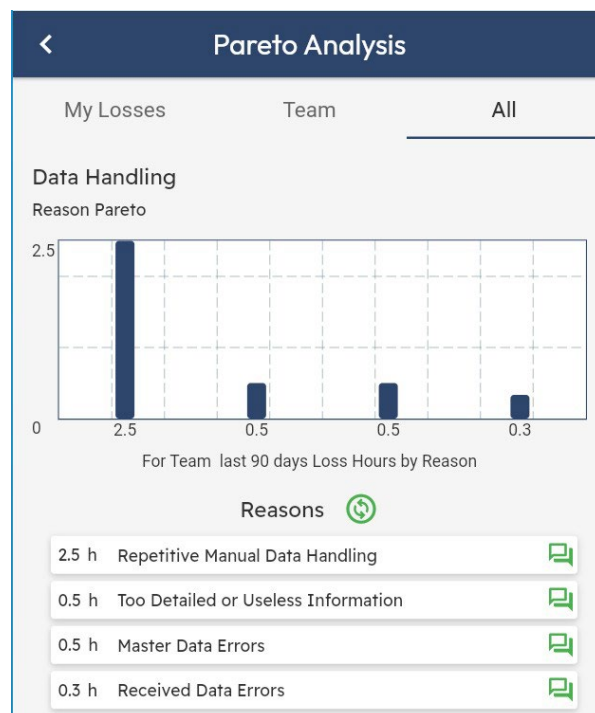


Figure 6: Example of a detail Pareto by Loss Reason

3. Results in Organizations

3.1 Organising Improvement Actions

3.1.1 One-time projects

We have experience in several companies of making first a study to map the initial potential (starting point). Then a number of projects is planned and executed addressing the top and medium size time losses as well as sometimes some “minor quick wins”. Later, a second measurement is done validating the achievements and discovering the next time losses to be acted upon. Sometimes this has been repeated even a third time.

3.1.2 Continuous Improvement (CI)

Companies where loss cards are registered continuously (or repeatedly multiple times a year) have been utilising Continuous Improvement (CI) approach (Figure 7). The idea has been to use appropriate models for types of improvement projects – e.g. 2-Step or 4-Step. Sometimes this has been anchored to corporate annual target setting by having number of completed projects and annualised cumulative time loss reduction as quantified targets for Units. Even including real-time follow-up and internal benchmarking in company intranet.

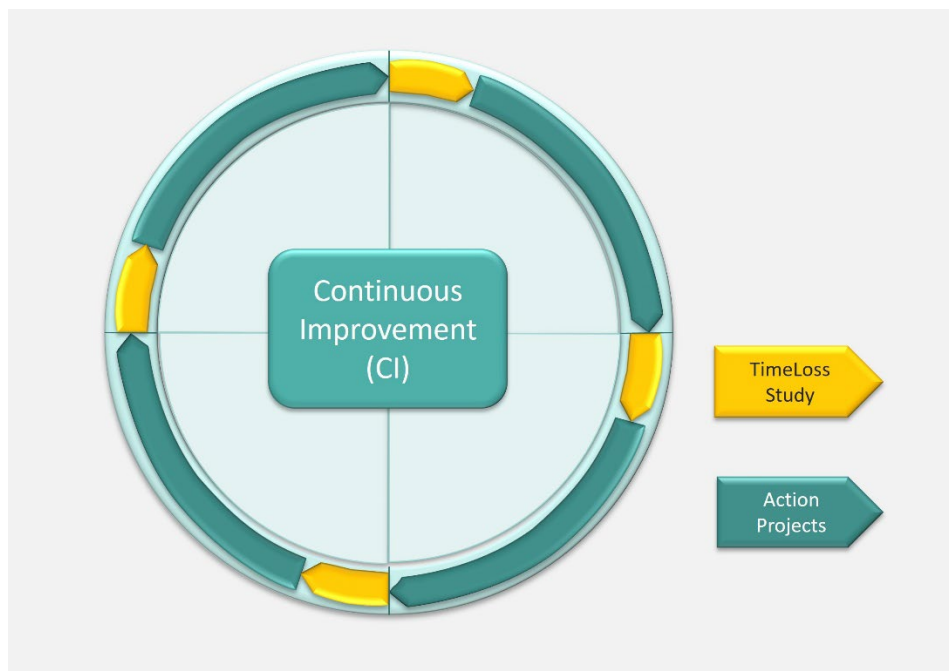


Figure 7: Continuous Improvement (CI) annual cycle with time loss measurement periods

3.2 Results Achieved

3.2.1 Reduction of time loss

Results using one-time-projects for teams (time span in teams and companies 1-2 years):

- Time loss reduction 5-75 % for teams and 5-20 % for companies (re-measurements 1-3 times).
- Typically, 20-80% of the identified improvement potential has been achieved.

Results using loss cards and Continuous Improvement (CI) approach:

- Time loss reduction annually over several years 2-25% for teams and around 3-5% annually for whole companies.
- Typically, 20-80% of the identified improvement potential has been achieved.

When using the CI approach, the impact of the improvement actions is verified through diminishing of specific loss cards, due to the root cause actions.

Interestingly, Peter Drucker is calculating the 50-fold productivity improvement of manual worker based on “rate of 3% per annum compound—which means it has been risen fifty-fold since Taylor” (Drucker 1999).

3.2.2 Focus on core job

Results using one-time-projects (conducted over 1-2 years within teams and companies):

- The share of core job activities improved by 5-40%, reaching up to 80-90% in some cases, with 1-3 re-measurements).
- Typically, 25-80% of the identified improvement potential has been achieved.

The ratio of core to non-core job activities is not directly measured in MyTimeLoss® or other loss card-based methods.

3.2.3 Well-being and motivation of participants

As consultants we always organise feedback meetings (communication) of study findings and action priorities and possibilities. Participants often express appreciation for “being listened to” and for the opportunity to initiate practical improvements in their daily work. Turning useless complaints into systematic data collection followed by actions to remove sources of frustration, is typically received positively. People report experiencing less frustration and greater motivation.

3.2.4 Observations by managers

Time studies have provided many managers with a feasible way to know better the daily activities and problems of their teams. Both activity focuses and time losses for different team members and different professional roles/subgroups are fundamental in improving the division of labour, balancing capacities, removing bottlenecks, improving tools and their usage as well as setting personal development goals (together with individuals). Managers taking part themselves in our studies often note that they learn to recognise time loss in their own work and observe similar learning processes among their teams and colleagues.

3.2.5 Experiences from start-up companies and more mature organisations

Start-up companies tend to work in a more situational and “inspirational” manner than more mature, organisations, with less fixed roles, responsibilities, processes and tools. Start-ups can however also benefit mapping and acting upon their time losses with MyTimeLoss®. Obviously the Paretos, Red flags and action ideas show points for improvement to provide more of the valuable knowledge workers’ net time for growth. Improvements to tools, processes and personnel competencies can often be simpler, more straightforward and faster to implement.

3.2.6 Learning to see

Perhaps the most valuable outcome is that individuals become more aware of how they use their time, learn to recognise time loss in their own work and also in and between their teams. Time loss becomes a topic to discuss during lunch or coffee break among colleagues and with managers. A proactive, preventative mindset also begins to grow. These organizations can thus achieve a big competitive advantage.

3.2.7 DIKW reflection

In the process of using MyTimeLoss® method, time loss *data* registered is transformed into *information* by loss classification, reason coding, key word tagging and systematic description. The information is then analysed using Pareto analyses across multiple levels and timespans, uncovering patterns, trends, and relationships. The resulting insights provide *knowledge* for all stakeholders of why and how the time loss phenomena occur. This, in turn, enables and encourages an organizational culture of continuous improvement, supporting both corrective and preventive actions related to time loss among knowledge workers. This *wisdom* cannot simply be copied across companies and organizations; it can only be achieved by progressing through the Data–Information–Knowledge–Wisdom (DIKW) steps.

4. Conclusion

Identifying time loss in knowledge work - by managers, engineers, controllers, researchers, nurses, teachers, and other knowledge workers themselves - enables its reduction and, in some cases, its complete elimination. The frustrations experienced - when work is not flowing as it should – disappear, allowing motivation and the working atmosphere to improve. There is time loss in every organisation in knowledge workers’ daily activities. Conducting time loss studies before, during, and after major IT investments—such as in Document Management (DM) systems, R&D software, or ERP systems—can significantly accelerate and, in many cases, ensure the

realisation of the intended productivity gains. Obviously, we consider this to be a win-win between customers, suppliers, organisations and knowledge workers.

The results we have presented stem from a structured series of steps. Firstly - like for the industrial pioneers developing the physical work study in last centuries – it is important to take a realistic “photograph” of the work. Today this is done with the motivated knowledge worker. The principle of “garbage in, garbage out” has never been worthwhile—and never will be. Secondly the data must be analysed. Pareto distributions of loss time and frequency on different levels show the top losses. Thirdly the root causes of top losses must be analysed, actions planned and executed, results measured and validated. This is common way for both one-time projects and CI. In both cases there must be adequate resources deployed to solve the root-causes of the losses in a limited time. From our experience, we recommend that organisations limit the number of concurrent improvement projects. The individual projects should typically not last more than 3-4 months.

To cover properly the work of medical doctors and other health care experts, teachers, salespersons, and others using essential part of their time in contact with one or several persons, we are developing the contents of *Contact Work* as 7th Loss Class. We are looking forward to co-operation with all interested academic or public/private sector actors.

Our contribution is a non-academic one. We are aware of the pioneering character of our pursuit. There is certainly need for fundamental academic research in Knowledge Management field on this topic. We welcome research on time loss in different professions and on “toolboxes” for effective improvement actions in certain typical time loss situations. We believe, that now is the time to implement large-scale time loss reduction in knowledge work across both the public and private sectors.

Time loss is a happy thing!

Ethics declaration: We hereby declare that this conference paper is our own work and that all sources used have been acknowledged. We have not copied or used unauthorized assistance. In all data collection ethical standards were followed, including consent and confidentiality.

AI declaration: We acknowledge the use of MS Word and ChatGPT for intermediate grammar and spell-checking. All final content of this conference paper was reviewed and edited in all details by us.

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