Professional Management of Performance Management $(PM)^2$ A practical guide for KPI management ©

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1. Introduction

Few people doubt the value of KPIs (Key Performance Indicator) as a tool for the management of business or organization processes. The use of KPIs helps management make correct decisions. However, the way that KPIs are used by most organizations is far from perfect. This paper will help the reader evaluate and improve KPI management.

All excellence models expect to not only develop enablers, but also to achieve results. The SAC-model[1](Society & Active Citizenship Model) also answers the question: "Is my country well managed?". Although working with KPIs seems obvious, putting KPIs in practice is not always easy. Many people struggle with the establishment and monitoring of key performance indicators. Quite often government organizations have difficulty finding, defining, and applying the correct indicators.

This paper treats the management of KPIs in detail, including solutions to encountered difficulties.

The application of the method described in this paper allows you to professionally manage KPIs. This application will lead you to effective performance management. We call this method $(PM)^2$ or PM square (Professional Management of Performance Management).

2. Definition

A Key Performance Indicator or KPI is a measurable value that demonstrates how effectively an organization is achieving the strategic plan. Organizations use KPIs at multiple levels to evaluate their success at reaching the targets. Senior management shall focus on the overall performance of the key processes and the achievement of strategic goals. Middle management shall focus on its core activities, processes in the departments and services but also contribute to the achievement of the strategic KPIs of senior management.

KPI management *monitors the progress* towards achievement of strategic goals. This implies that leaders are acutely aware of what performance is important and how to measure this performance. They must work with reliable measures and targets are ambitious, but realistic.

3. Usefulness of a KPI

When you work with KPIs, the following seven questions must be answered:

1. What is your desired outcome?
2. Why does this outcome matter?
3. How are you going to measure progress?
4. How can you influence the outcome?
5. Who is accountable for the outcome of the organization?
6. How will you know you've achieved the outcome?
7. How often will you review progress toward the outcome?

Example1: Application of these 7 steps

A county council decided to install a system of traffic surveillance cameras. Car drivers who speed receive a ticket. The objective is to increase safety on the roads by reducing speeding. Reducing speed reduces accidents, which reduces casualties and death. A goal is to drastically decrease the number of casualties within 10 years.
From this general long-term objective, the KPI is defined as follows:

1. Desired outcome: decrease of the number of casualties and number of deaths in the county by over 50% in 10 years.
2. Why does this outcome matter? Last year there were more than 800 severely injured people and 71 deaths in the county. If we can reduce these numbers by over 50% this will lead to higher well-being for more than 400 persons and their families.
3. How are you going to measure progress? KPI 1 is the Total number of tickets per month, KPI 2 Total number severely injured people/month, and KPI 3 Number of deaths per month. You might also add three sub-KPIs, segmenting results for the urban streets, rural roads, and major highways.
4. How can you influence the outcome? Drivers who received two tickets within 6 months lose their driver's license for one month.
5. Who is accountable for the outcome? The Sheriff and his team are accountable for the management of these KPIs.
6. How will you know you've achieved your outcome? Comparison between the actual measure and the target.
7. How often will you review progress towards the outcome? Percent of current casualties versus baseline on a monthly basis.

4. Difference between a KPI and an indicator

From the above definition of a KPI, it follows that we need to differentiate between an indicator and a key performance indicator. The latter is always linked to the long-term goals, which are aligned with the vision and strategy of the organization. The number of KPIs for an organization should be low; a few KPIs for each leader of the management team and their direct subordinates.

At lower hierarchical levels indicators that are used should be aligned with the KPIs of management. Also, the teams and team members each have only a few indicators (maximum 5 each).

5. Standardization of a KPI

A KPI is presented in a standardized manner. This method has the advantage that reading, interpreting, and evaluating a KPI can be done quickly, regardless of the subject being treated by the KPI. In addition, there is little chance that the presentation of the KPI will be incomplete. It also helps avoid misunderstandings and wrong decisions.

An additional advantage of a standardized presentation of a KPI: you can quickly read and interpret the KPIs and results when the leaders of all AOPS (All Organizations of the Public Sector)[2] put their KPIs on their organizational website[3]. If each AOPS has its own way of presenting a KPI, the interpretation of the KPIs and results will take longer. It is more difficult to compare the different AOPS performance. This non- standardized approach may also obscure important parameters, for example, the alignment of the KPI with the strategic objectives of the organization.

5.1 Structure of a KPI

The *standardized KPI* consists of seven sections. As soon as all seven sections have been precisely described, i.e., the description of a KPI can be considered complete. The seven parts are: 1) title, 2) owner, 3) purpose, 4) tree of indicators[4], 5) technical definition and measurement method, 6) presentation of the results and 7) discussion of the results by the KPI owner.

5.1.1 Title

The KPI starts with the most obvious part: the title. This is short (one to three words). The title does not contain a target description. The title only indicates the subject.

5.1.2. Owner of the KPI

Then the name (first name and last name of the owner + his/her position) is displayed. This is not only an expression of the *accountability* of the person who feels responsible and behaves accordingly, but it immediately validates that every manager in the organizational chart must have at least one KPI.

It is remarkable that omitting the name and function of the KPI leads to poorer management of the KPI. As soon the KPI is "managed" by an anonymous person, nobody feels accountable to take the necessary measures when difficulties arise. Therefore: always document a name and function of one person for each KPI.

5.1.3 Objective to achieve

In the third section of the KPI, an answer is formulated in detail to the question: ***"What do I want to achieve with this KPI? What is the outcome when the goal is achieved?"*** The owner of the KPI also describes the "*Why?" How is this aligned with the vision and mission of the organization?*

Example 2: Patient satisfaction in a hospital

What do I (medical director) want to achieve with this KPI?

- All patients are satisfied with the medical care provided
- The relatives of the patients are satisfied with how their relative has been treated
- There is smooth cooperation between the medical and paramedical staff
- Patient satisfaction is measured using a quarterly patient satisfaction survey
- The administrative and logistical aspects are also treated
- The survey is conducted by handing over the questionnaire to the patient on his last day of hospitalization

Although this description is already nuanced, a number of things remain unclear. For example, no reference is made to the strategic plan of the hospital, only patients who stay in the hospital for more than one day are questioned, it is not clear whether it concerns only closed questions and/or open - ended questions, nor it is stated that the output of this survey serves as input for the quarterly improvement plan. Patients apparently are not asked what the hospital could do beyond what is being surveyed.

The owner of the KPI starts with a clear and nuanced description of the goal. In addition, the owner of this KPI provides a description of the relationship between the realization of his indicator on one hand and the following elements on the other hand:

- How is this KPI aligned with the strategy of its ministry, department, organization?
- How is this KPI aligned with the strategy of the Board of Directors (for non-profit organizations)?
- How does this KPI contribute in a positive way to a better balance of payments and trade in the country or region? Of course, there are situations when this question isn't applicable, such as the case here with hospital patient satisfaction.
- How does this KPI contribute to a more positive business climate in the country or region? This subject depends on the type of AOPS.
- How is this KPI directly related to the realization of one or more core tasks of this manager (leader)?
- How does this KPI contribute to a better realization of the objectives of his direct superior?

Not every AOPS will be able to answer every question on the above list.

Practical hint. The description of the goal to be achieved is useable as soon as it is described in detail in *visual terms*. The reader should be able to imagine this vividly and visually. If so, then the objective of the KPI is what is commonly called SMART, i.e., Specific, Measurable, Attainable, Relevant, and Time-bound (deadline).

In this section you can also provide:

- A description of the boundary conditions, e.g., minimum sample size and sampling method
- The target is ambitious and realistic at the same time. From the description it can immediately be deduced whether the indicator is a measurable indicator rather than a statement of intent. When you achieve the set target too easily, you know that the target was too low. You realize the target was too ambitious when you can't achieve the target. This can also lead to demotivation and frustration among team members. "Too low" and "too high" are the two extreme situations to avoid. From experience we know that you can set a realistic target at 90% of a very ambitious level.
  Once you have reached the target, you set a new target. In this way you move step-by-step towards higher levels of achievement. If this is not done in a systematic way, then the spirit of continuous improvement is absent.
- Benchmark. You can also refer to a benchmark. It is not necessary to refer to the best-in-class in your sector. Example: with the Belgian bank, KBC[5] a customer can obtain a home mortgage in 10 minutes instead of a cycle time of days or even weeks. This benchmark can inspire civil servants who are responsible for delivering all types of permits. Today this delivery may take days or even weeks.
- Abbreviations will also be explained in this section.
- If technical or difficult words are used, the owner will explain them here.
- You can also mention sources here and preferably provide hyperlinks to them. This gives the reader more background information. This also increases the reliability of the KPI.
- Explain how the KPI positively contribute to one or more of the ten links of the SAC model.
- Explain what the relationship is with one or more SDGs (Sustainable Development Goals of United Nations)[6].

Explaining what you wish to achieve with a KPI may seem obvious and simple. Daily practice shows something different. Many people don't distinguish between an ***activity KPI*** and a ***result KPI***. The latter one is a real KPI. However, when people start to use KPIs, they often start with an activity KPI,

i.e., a description of a step-by-step approach. These leading indicators of project or process steps are short term. The driving indicator is the lagging or result KPI. Each of the leading indicators should guide the project or process to the final desired result.

An activity KPI says nothing about performance nor impact. However, an activity KPI can sometimes be useful and necessary.

Example 3: First, set an activity KPI and then a results KPI

The State Government decides to establish a detailed map of how land is used in the state (urban streets and rural roads, highways, residential homes, industrial zones, commercial surfaces, playground and cultural activities, schools, parks, and nature). This mapping requires satellite data. The first step is to define how to measure the corresponding surfaces and then to develop the software. The establishment of an "activity KPI" through which the work is organized and improved, additional training is given to the employees, as well as the development and implementation of a "results KPI" to measure, monitor and adjust land use performance. Once this project ("activity KPI") has been achieved, they can move on to the "results KPI", which is used to monitor the core process.

A systematic use of KPIs, helps all leaders and team members to stay *focused* on what is important for the organization, i.e., the long-term objectives. Without a systematic use of KPIs, leaders and employees become distracted and achieve fewer results compared to when focus is present.

Results KPI

Once you have described the details of the planned goal, you can compare the current state to the desired situation. **Result KPIs show the impact or outcome results**. This results KPI, monitored month after month, indicates whether you are closer to the set goal.

Example 4: Possible outcome objectives for a country

Reduction of Greenhouse Gas (CO_2), improvement of air and water quality, employment rate of the country, contribution to the trade balance of the country, quality of education, improvement of mobility in the country, etc. Also refer to one or more *Sustainable Development goals* (SDG) of the United Nations.

Each board member and each member of the management team will align his objectives and KPIs with the strategic objectives of his organization. This may seem obvious, but the reality is sometimes different. Stacey Barr[7], an expert in KPIs, once conducted a sample survey in her country (Australia). She found that only eight percent of government organizations surveyed had quantifiable KPIs that contributed to the realization of the organization's strategy.

The SAC-model requires that the KPIs of the executives are aligned with the strategy and the business plan (Annual Work Plan) of the organization. The KPIs of the management team are also aligned with the next higher level, i.e., an organization that is higher ranked, e.g., a nongovernmental organization aligns its objectives with the objectives of a ministry.

For readers who are familiar with excellence models such as Baldrige or EFQM know that you need to manage enablers which lead to results. To achieve better, excellent, and sustainable results for the AOPS, you need to manage a small number of results KPIs which are linked to enablers.

5.1.4 Tree of KPIs

Each member of the executive committee (board of directors, management team, etc.) of every AOPS places a hyperlink for at least one KPI to a KPI of a higher management layer. In this way, it becomes clear how every AOPS contributes in a positive way to the creation and maintenance of sustainable results for both prosperity and well-being of the country. Thus, a tree of KPIs is created.

If a topic is covered by another AOPS, the owner of this KPI will also display a hyperlink to the KPI of the colleague from the other AOPS. You can think of topics covered by Ministry of Mobility and Infrastructure at the federal, state, and regional level. In this way, the website visitor can quickly see how efficiently things are done (little or no overlap, no fragmentation of resources, …).

5.1.5 Technical definition and measurement method

Definitions of words as well as the measurement methods used, and references of norms and standards are described here.

You can only make accurate decisions based on reliable data. These decisions are not based on opinions, impressions, gut feeling, prejudices, intentions, etc. This means that the measurement results (data) meet the following **additional conditions**:

a) Random samples

The samples taken are representative of the entire population of data. The samples are taken at random.

Example 5: Surveys at schools

The Education Department of the Regional Government wishes to find out through a survey how primary school teachers deal with the integration of migrants and refugees in the classroom and school. The choice was made to send the survey to a sample of teachers. Random sampling means that each teacher has an equal chance of being selected within the sample. As soon as teachers from some schools are selected, for whatever reason, we can no longer speak of a random sample.

Representative sampling means that the conclusions based on the results of the sample are the same as if we had surveyed the entire population. If only the primary school teachers in cities are questioned and those of the countryside not, we are dealing with a *non-representative sample.*

b) Segmentation of the results

Example 6: Segmentation of the results for a city center survey.

The population of a city may consist of the following segments: o Age: babies, toddlers, children, teenagers, young adults, adults, the elderly and the very elderly. o Occupation: civil servant, teacher, worker, employee, managers, self-employed, liberal

profession
- Function: operational (e.g., production), supervisory (e.g., management or middle management), support (HR, Quality, Safety, Accounting, Finance, Facility Management, ...)
- Diploma: primary education, secondary, vocational, bachelor, master, doctor

c) Reliability and repeatability

The measurement error is small. When the measurement is repeated, the result will be the same (within the measurement error). Sufficient samples are also taken as function of the time (frequency of the sampling) so that correct decisions can be made.

Example 7: Ministry of the Environment

Inspectors of Ministry of Environment take soil samples to check for nitrate and phosphate contamination (due to the use of fertilizers). If samples are only taken annually, the farmer will not fertilize his soil for several months until the samples have been taken. This sampling method is, of course, not appropriate.

In some cases, the leaders of an AOPS can unknowingly make the data supplied less reliable.

Example 8: The way in which data is handled

Leaders ask collaborators to carry out a series of measurements. These are dutifully delivered to them. Weeks later, the collaborators didn't get feedback from the leader and therefore still don't know what happened to the reported data.

You can guess that the collaborators will choose the easiest way to report the requested data next time. The reliability of the data is deteriorating. They do not receive any feedback on the extent to which the data meets the expectations of the leaders. It is very important that every leader gives feedback and explanation to their collaborators BEFORE the data is collected and AFTER reporting what has been done with the data and what the impact was of this data. This leads to an increased motivation from collaborators. As a result, the collaborator now knows what is important. They will pay sufficient attention at all steps of the measurement process to ensure that the reliability of the data is high.

Not giving this information and feedback leads to passive employees who do not have much awareness of what "reliable data" is and why it is so important. Again: you can only make the right decisions based on the right data.

Example 9: Audit

An employee of the quality department carries out an audit on the process of issuing permits. He prepares an audit report. He then discusses the findings with the head of the Service Permits. The latter believes that the report is too sharply written and softens the sharp words. This report is then sent to the head of department. On his turn, he believes that the report should not be written in such a "rough manner". He adjusts the writing style and vocabulary. The amended report then comes into the hands of the director of the department. This has been formulated "too negatively" for his taste. He also softens this report. The general manager receives the final report and conclude that everything is under control.

This is an example where corporate culture plays a detrimental role. How the head of department came across to his hierarchical superior is apparently more important than facing the truth and putting it on paper. A culture of blaming or lack of accountability will limit the use of valid data and lead to bad decisions. This audit report is worthless and can be placed in the category of organized waste of money. Reliability of the data is zero!

Example 10: Comparison of strikes in Europe

Each country of the European Union keeps a number of statistics. This makes it possible to compare the performance of the different countries. One of these measurements concerns the number of strike days and the number of strikers per year and per country. Greece scores highly in this area, but has stopped keeping statistics on it, because that was not good for the image of the country.

That is why it is good to check whether the results are *reliable* for every result, every graph, and every report. Otherwise, you will draw wrong conclusions.

d) Sample size

The news on radio and television is often illustrated with street interviews. Only a few people are interviewed. This can give a distorted picture of reality. In fact, this is a form of data manipulation. Interviewing two or five people is far too small for a representative sample. The only conclusion you can draw from this is what these two or five people think. You can't predict what the whole group of people really think. If you want to know an objective average of the residents of a large city, your sample will be 1,500 people or more and the sample will have to be taken at random and must be representative (think about segmentation of results)!

e) Exact description

Be careful with measures such as index and global indicators.

Example 11: Ministry of Infrastructure

An infrastructure ministry manages its total budget, i.e., the money spent on investment in and maintenance of the roads, bridges, and tunnels. It is impossible to say whether the investments, the maintenance or both are well managed or not. You need the segmented results showing value of individual projects.

f) Perception-based measures and behavior

There is nothing wrong with asking people their ideas or opinion. But you have to be aware that perception and behavior are two completely different things. You can ask about personal political preference a few months or weeks before an election. People will answer as they think and feel at that moment. Once the elections are over, politicians and journalists comment extensively on the mistakes of the polls that were conducted. It is easy to forget that a survey only asks for opinion. People answer *intuitively*. When, on the other hand, exit polls are held, i.e., the people who leave the polling station after voting, are asked which party they voted for, the question is about their *behavior*. That's why exit polls are quite accurate. Election surveys

can sometimes show large deviations. Therefore: distinguish between perception and behavior. Otherwise, you could make incorrect decisions.

The same thing is also true when surveys are conducted by customers of the public sector. Leaders need to be cautious when designing their questionnaires and certainly in analyzing the results of the surveys. If not well done, surveys could lead to wrong decisions and action plans. In addition, it is useful to compare perception measurements with actual performance measurements.

Example 12: Litter in parks

The municipality organizes a survey of its citizens and ask questions like “To what extent are the parks in our city free of litter?” Two thirds of the respondents surveyed say that the amount of litter is too high, while the kilograms of litter in the different parks collected every three months (by municipal services and/or youth movements) reveal that half of the parks are free of litter.

This example illustrates effectively that a perception (interpretation, intuition) is not the same as behavior (“Who does create the litter in the park?”).

This example demonstrates that the question was too general “… are the parks free of litter”. There was no mention about which park and what “free of litter” means. This is an example of an imprecisely defined question.

g) Relevant.
Each measurement individually may be interesting, but not yet useful. First think about what you want to achieve and how the measurements can contribute to the realization of the strategy and/or business plan of the organization.

Example 13: Cycle paths

A rural municipality with many forests and natural spaces wants to greatly expand the cycle path network. For this, the city manager installs automatic counting machines in a series of places. She also hires volunteers to perform manual counts. They count the number of cyclists, divide them into categories such as man/woman, child, adult, elderly people, type of bicycle (city bicycle, mountain bike, electric bicycle, children's bicycle, cargo bike, folding bicycle, etc.), etc. This data is stored in a voluminous book with lots of statistics.

The question you can now ask: What do they want to achieve with these measurements? Which useful and necessary conclusions can be drawn from these statistics? Perhaps the original question was: do we need to build more cycle paths? You can ask yourself: do you need this extended count? Often too much time, energy and budget is spent on surveys with little added value.

There is an even more important observation: perhaps they are measuring the wrong things, namely how busy the existing bicycle paths are, while elsewhere in the municipality there is a greater need for new bicycle paths or the elimination of dark areas on existing bicycle paths (many accidents and car accidents).

This example once again points out how important it is to first ask: "*What precisely do I want to achieve?*"

5.1.6 Presentation of the results

In the sixth section, the data are presented in a table. The results are also, as far as possible, presented in a graph. This graph shows both the results and the target. If there is no target, we refer to a statistic and not an indicator.

Frequency of monitoring the parameter.

The chosen frequency depends on the parameter used; it can be weekly, biweekly, monthly eventually bimonthly. If the frequency is too low, e.g., every six months or even yearly, you should ask yourself whether it is a KPI or a statistic. The aim of a KPI is make progress, to see in daily life a step-by-step progress towards the planned target. You can't wait six months if you check the KPI only bi-annual before you take corrective action. If the frequency of control is low, you have to identify another leading indicator that you can steer monthly and that will contribute in a positive way to the realization of the "bi-annual KPI".

It is essential that the owner sees an evolution of the parameter over a longer timeframe. You can only observe a trend over a period of five years or longer.

Be careful

Observe the scales of a graph carefully (both x-axis and y-axis). Sometimes these are manipulated showing only a small portion of the scale. The upper part of the figure is greatly enlarged, which can give you a distorted image.

It is valuable to monitor performance of an indicator over a number of years to avoid making wrong decisions. If you look at the price of gold s over the last five years you will draw different conclusions depending on whether you look at short, medium, or long-term price fluctuations. The chart of the price of gold for the last month (September 4 – October 4, 2021) (figure 1) indicates that the price of gold is falling. The chart for one year (October 2020- October 2021) (figure 2) shows that there is a large fluctuation in the price of gold. The 5-year chart (2016-2021) (figure 3) leads to the conclusion that the gold price is rather constant at approximately $1200/ounce for the period 2016-2019 and then it increased to a much higher value, approximately $1800/ounce for the period 2020-2021.

Figure 1: This chart is based on facts. It gives a detailed evolution for the period September 4, 2021, till October 4, 2021. The conclusion you would draw from this chart is "the gold price is falling".

Figure 2: This chart demonstrates a large fluctuation in price over a period of one year. It is hard to discover a tendency in this chart.

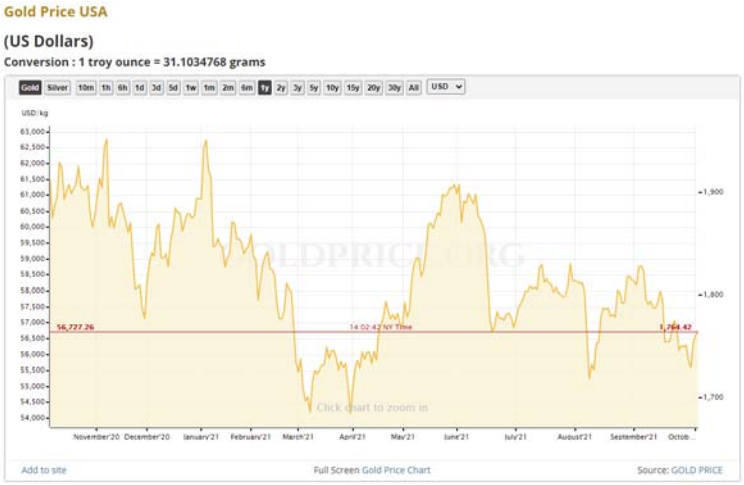
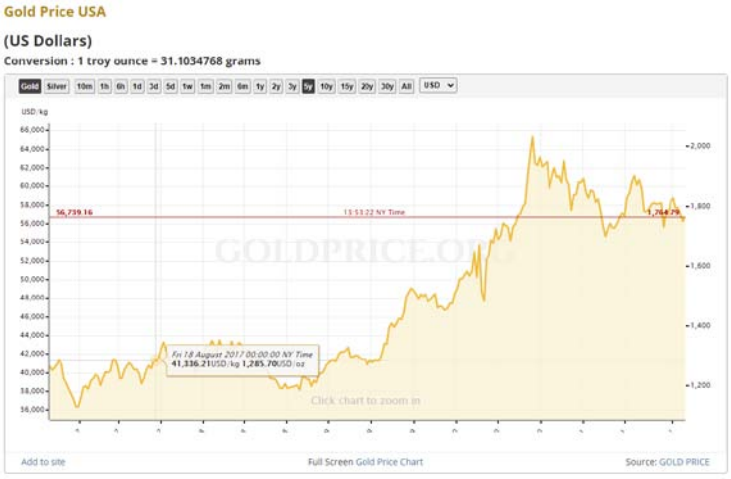


Figure 3: The interpretation of this chart leads to the conclusion that the price of gold is rather constant in the period 2016-2019 and then it increased to a much higher value (approximately $1770/kg).



This example proves that

- **You can draw incorrect conclusions when you consider a series over too small time period** (compare the results and conclusions of the three graphs)
- The y-axis scale is different in the three graphs.
- **An explanation of the results (the price of gold) is necessary** (when do you buy or sell gold and what are the price expectations for gold in the future (depending on the supply and demand of gold and the political situation in the world))
- If these **explanations** are not provided by the owner, the reader of the charts may draw incorrect conclusions. That is why with a KPI not only results are given (preferably in a graph), but also **an interpretation and discussion of the results obtained by the owner of the KPI**. It is up to him to describe the actions (decisions) taken for further improvement of the results.

5.1.7 Discussion of results by the owner of the KPI

In the seventh section of the KPI, the owner of the KPI provides a discussion of the results within his team. He also indicates what he will do within the next month to make progress.

A weekly or monthly analysis and corrective actions of the current performance is essential. Without this you're left to search blindly for numbers that are not founded in reality. Your current performance is also a good starting place for deciding on areas upon which you need to improve.

A KPI owner may be tempted to present the results optimistically, i.e., the target is easily achieved, or he extrapolates the results to the future without giving much explanation. It is very normal that occasionally the target is not achieved. A target is a tool that helps you to develop new action plans so that you achieve the goal step-by-step. The aim is not to please someone, but to achieve results, even when it takes much effort and energy.

5.1.8 Discussion of the results by third parties (website visitors)

The leaders of the KPI put their indicators on the AOPS-website (see SAC-Model). The third parties can then provide their feedback to the owner of the KPI.

The persons who have provided feedback on the KPI (on the website of the AOPS where the owner of this KPI works) can immediately see whether their feedback has been used. Note: the owner is not obliged to apply the suggestion made. The "owner of the KPI" can autonomously decide whether to act on the feedback.

Why would a website visitor give feedback? Many citizens do want to be more involved in subjects that concern or interest them. In this way they are *better* and *correctly* informed about a current situation. A second advantage has to do with the context in which we live today: there is a lot of fake news and incomplete or unreliable information in reports, newspapers, media (radio, television, magazines) and social media (Facebook, twitter…). When all leaders of AOPS update their KPIs monthly, the visitor can consult a more reliable source quickly and easily. This is theoretically possible today (there are many databases available), but it takes time to find an answer to your specific question.

Example 14: Electric cars

In Europe, the Paris Climate Agreement is high on the agenda, thanks in part to the weekly youth demonstrations (2019). You hear and read often that in the next 10 to 20 years we will be required to switch to electric cars or even better, make more trips by (electric) bicycle. Of course, this requires Li-ion batteries (we refer to Li-ion technology because this is the most feasible method for propulsion of cars today). These batteries require the metal cobalt. But cobalt is found in very few ores and in very few places in the world. A visitor can then wonder about the following:

- How much cobalt is mined annually worldwide now?
- What are the labor conditions in the cobalt mines?
- How many kilograms of cobalt are needed for a battery of an electric mid-range car?
- How many cars were put on the market in Europe and the rest of the world last year?
- How much cobalt will be needed in 2030 and 2040 for electric car batteries?
- How much will a battery cost if the world switches massively to Li-ion batteries?
- What impact will this increased demand for cobalt have on the current civil war in Eastern Congo (Katanga) were most of the world's cobalt is found?
- What is the impact of the poor mining conditions in Katanga on the environment and the local population?

How many hours (days) do you think you will need to answer these questions? Do you know where to look? For countries using the SAC-Model, this will be much faster. Under the SAC-model, you can quickly find the KPIs related to cobalt mining using a few keywords. There will be several AOPS that are involved in this endeavor and the KPIs of these AOPS are linked (hyperlinked) to each other.

Third parties such as NGO's report on the worker situation in Eastern Congo. Nevertheless, the government of Democratic Republic of Congo appears unable to improve this situation. The higher demand of cobalt in the near future will increase pressure on the government to do something about bad working and environmental conditions in Katanga (Eastern part of Congo).

The visitor cannot formulate feedback anonymously. He must always state his last name, first name, e-mail address and telephone number. To prevent misuse by third parties, this personal data is not visible to other website visitors.

The (anonymous) feedback from all surfers remains visible to everyone. The owner may and/or may not make any changes to his KPI.

Judgments, condemnations, reproaches, etc. are not permissible. The visitor will receive a warning from the owner to refrain from non-objective feedback. On a repeated entry, his name and email address will be blacklisted for two years.

Below is an example of KPI Customer Satisfaction. You'll recognize the standardized lay-out. Notice that the amount of text is rather limited. This also means that the amount of work for the KPI owner is limited. In any case the KPI owner is obliged to provide this documentation because this is a core task.

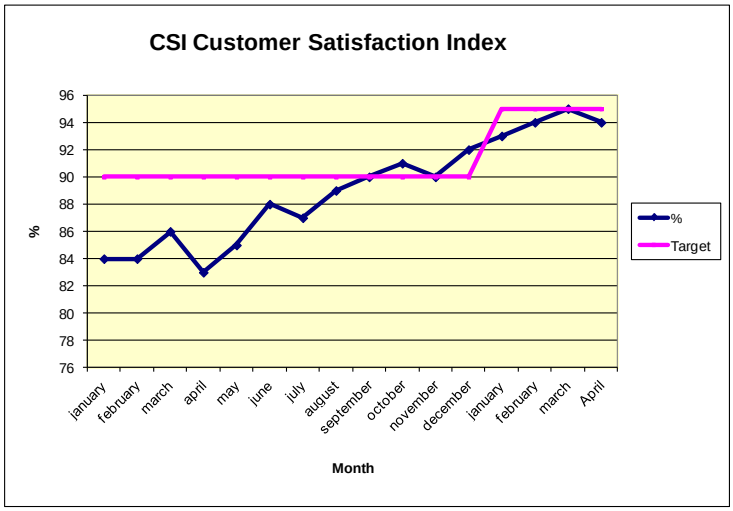
5.2 Example of a standardized KPI

We first present the KPI. Next, we discuss an interpretation of the KPI report.

Context: a city administrator provides different types of documents to her residents, such as passports for adults and children, driver's licenses, documents for elections and different kinds of permits. On a monthly basis, a third party asks a sample of these resident's questions about their perception of the service delivered by the city's civil servants. This data is reduced to an index. 100% means that the citizens are completely satisfied and haven't any recommendations how the city administrator can improve her customer service.

Example 15: Example how a KPI is used in a city: KPI Customer satisfaction index

Section 1	KPI Customer Satisfaction Index
Section 2	Owner: Jill Peters
Section 3	What do I want to achieve?
	We want to achieve 100% satisfaction of our customers
	We plan to improve our customer service
	Everyone should do their best
	I don't accept failures
Section 4	Tree of KPIs
	KPI: Complaints from customers
	KPI: Overall customer satisfaction of the city
Section 5	Technical definition and measurement method
	A sample of 1500 persons is taken
	Each person answers 4 questions
	The results are presented as an index
Section 6	Presentation of the results (see graph)



Section 7	Discussion of the results by the owner of the KPI
	We worked well, we achieved the first and second target
Section 8	Discussion of the results by third parties (website visitors)
	Visitor 1 Nice result. Congratulations
	Visitor 2 What is the target for the coming months?

Authors interpretation of the KPI

Section 1	No comments
Section 2	Jill Peters function is not listed (City Administrator)

Section 3	The objective must be described in detail and in visual terms. From the description here it is not possible to have a concrete idea what Jill Peters wants to achieve. There is no evidence how this KPI and corresponding objective is aligned with the strategic objectives of the city There is no connection with one or more links of the SAC-Model "Everyone should do their best" this is not an objective; this is an order. This kind of expression should be avoided. "I don't accept failures" should be rephrased. An objective is always expressed in positive terms This description is an example of what you see in over fifty percent of reports. The goal is not attractively formulated for Jill Peters' team members. Therefore, it is not surprising that the team members will not be highly motivated, and that Jill will have difficulties achieving her goal.
Section 4	Tree of KPIs It is good that Jill makes a connection to other KPIs in the city Jill could also make hyperlinks to KPIs of higher government levels (e.g., ministry of Interior).
Section 5	Technical definition and measurement method The questions are not presented. It is necessary to list the specific questions so the team members know where and how they can improve customer service. We have no information about the reliability of the measurements. Are there, perhaps, some leading or biased questions? Are the questions too difficult to answer because the words are so complex that most citizens cannot understand the question?
Section 6	Presentation of the results This is OK with the exception that the target for the coming months should be stated. Stating the target makes it clear where the administrator wants to go.
Section 7	Discussion of the results by the owner of the KPI "We worked well, we achieved the first and second target". This is a comment not an interpretation of the results. Are the results achieved "by accident" or is it due to a well-designed plan? There is no evidence of decisions nor action plans. The results need to be discussed within Jill Peters' team monthly. Important: as soon the target is reached, the target should be raised.
Section 8	Discussion of the results by third parties (website visitors) Good remark from surfer 2: asking what the target is for the coming months.

If this KPI is applied effectively, it will lead to continuous improvement and a learning process.

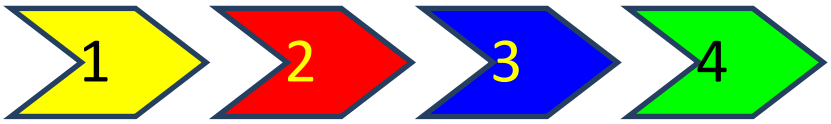
This example is a good illustration that managing a KPI in a professional way is not always obvious.

This approach can be applied to every important function within the country. One obvious objective is e.g., the management of a country's debt. In the West there are no countries which manage their debt situation using a KPI. Many civil servants address this subject in reports and statistics, but there is no evidence of use of a KPI to track the national debt as managed by one accountable owner.

6 Types of indicators

6.1 Input, process, output, and outcome KPIs

A key process can be monitored by four types of indicators: 1) input indicator, 2) process or throughput indicator, 3) output indicator and 4) outcome indicator.



Let us use a metaphor to illustrate this concept. We take the process of "cooking".

Example 16: Process of cooking

1	2	3	4
			
Input	Throughput	Output	Outcome
KPI # ingredients	Cooking time Cooking temperature	Prepared dish	Degree of satisfaction

A practical example of a police station will illustrate how different these four KPIs are.

Example 17: Traffic surveillance to monitor road safety.

Input indicators
- Number of FTE police constables
- Number of measuring devices (radar units)
- Budget
- Investment in radar units

Throughput (process) indicators
- Number of hours of actual speed monitoring

Output indicators (leading indicators)
- Number of checked vehicles
- Number of vehicles having exceeded the speed limit
- Number of traffic accidents

Effect or outcome indicators (lagging indicators)
- Number of casualties (seriously injured people)
- Number of deaths

Every AOPS must classify its KPIs according to their key processes. It is immediately apparent that **members of the management team are accountable for output and outcome KPIs.** However, the authors observe that in practice, the leaders of government organizations often only monitor the input and process KPIs, which should be managed at lower hierarchical levels. The police department monitors and reports the input and throughput indicators. The resulting output and outcome measures will indicate increased traffic safety to higher city management if the input and throughput measures are correctly chosen.

Example 18: Input KPIs and process KPIs

- Days of training per person (input KPI)
- Staying within budget limits (input KPI)
- Lead time for the processing of environmental permits (process KPI)
- Timely delivery of permits (process KPI)
- Cost of auditing a file (process KPI)
- Number of deviations identified during the realization of public works (process KPI)

Example19: Output KPIs and outcome KPIs

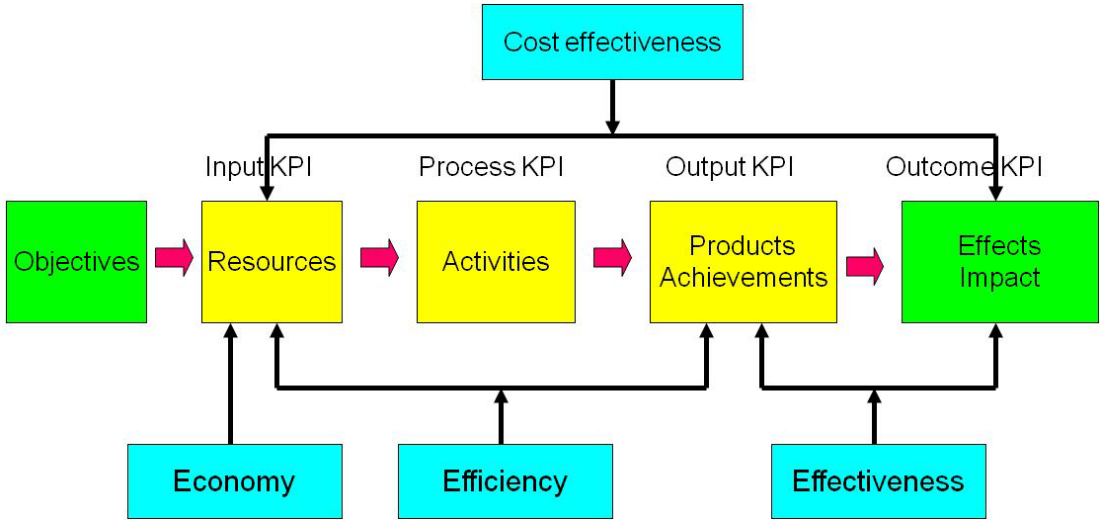
- Increase in the efficiency of a key process (output KPI)
- Increased employee satisfaction (output KPI)
- Increased customer satisfaction (outcome KPI)
- Achieving strategic goals (outcome KPI)

It is necessary to distinguish between these four types of KPIs because they lead to different kinds of management: efficiency and effectiveness.

6.2 Efficiency versus effectiveness

The management team manages output and outcome KPIs. They are responsible for *doing the right things*, i.e., the achievement of long-term goals.

Middle managers are responsible for managing *things right*, i.e., they monitor the input and process KPIs.



Now that we know what a KPI is, let us see how it is structured, how it is used and how it can be managed through four different, complementary types of KPIs.

7. Management of KPIs

Other aspects of KPI management are important to consider.

7.1 Key processes and KPIs

Each organization has a small number *of key processes* leading to the planned results[8]. These key processes are managed by the owner of each process using KPIs. Some typical governmental key processes are inspection (such as checking the state of bridges and roads for the Infrastructure Department), controlling (such as verification of the tax declaration of citizens and companies, adherence to labor laws by companies, etc.) and licensing (environmental aspects such as water, air, soil, noise).

7.2 KPI and stakeholders

Each organization has several stakeholders (customers such as citizens and companies, employees, suppliers, society at large, non-government organizations, political parties, etc.). Each of these stakeholders has a set of expectations. Each AOPS has to agree with its stakeholders which objectives are identified and how these objectives will be achieved. Therefore, an AOPS leader and someone from the stakeholder will monitor progress through their KPIs.

7.3 Choice and number of KPIs and indicators

In any organization you will be able to find many indicators. But not every indicator is equally important. A KPI (Key Performance Indicator) means that only important parameters are monitored, i.e., those which are aligned with the strategic goals and priorities of the government and /or top management of the AOPS. Also core activities of the organization can be managed by KPIs. But be careful that the number of KPIs doesn't become too large. There are some useful tools to reduce KPIs to a smaller number:

- make use of the Pareto-principle, i.e., the 80/20 rule. Twenty percent of the list of KPIs delivers 80% of the results,
- members of the management team use only output and outcome KPIs,
- delegate some of the KPIs to collaborators at one hierarchical level lower.

Nevertheless, the number of KPIs per leader of the organization should be limited to a small number, maximum 5 KPIs per person.

7.4 A KPI is a decision tool, not information management

The authors participated as observers in many meetings over the last 20 years. They often saw the meeting end up as an *information meeting*. The agenda starts well with reporting the first KPI, but quite rapidly the group starts asking for more information and data, demanding an explanation, or telling the group that things are not clear, that they have another interpretation of the planned objective, etc. A large amount of time is wasted and only a few decisions are made in that meeting.

If the KPIs are well managed in the meetings, it should take no longer than 10 minutes to make a decision on a KPI. The leader prepares his meeting well and applies all aspects of a standardized KPI. It is an illusion to think that you can jump immediately "to a conclusion" and make a quick decision. It is necessary that all members in the meeting agree on the decisions and action plans. The action plans must be put into practice. Implementation of the action plan is only successful if everyone has the same interpretation of the decision made in the meeting.

At the end of the meeting, you can check that the meeting was indeed a *decision meeting* or only an information meeting. In the former case people in the meeting speak about decisions, proposals for decisions, action plans, who will do what, when, etc. In the latter situation, people speak about what happened over the past two weeks, avoid blame, discuss the problem, try to solve the problem in the meeting, etc. At the end of the meeting ask the following question: "*How much time were we looking toward the future (next week or month) and how much time were we looking back?".* The group that worked professionally will say "80% forward and 20% backwards". If the team worked in an "information mode", i.e., looking backwards for 80%, you should ask what the team members will do in the next meeting to be better prepared and make effective decisions.

7.5 Continuous improvement

One aspect of professional management is the application of continuous improvement[9] of key processes. This allows the key process owner to achieve his objectives better and more quickly. Only when all the components of a key process (procedures, instructions, all aspects of the KPIs, etc.) are improved, can you speak of professional management.

7.6 Participative management and KPIs

Many leaders have the tendency to manage the KPIs by themselves. If they would work together with their colleagues and/or team members, they'll discover that working as a team is more satisfying. Teams can take advantage of the experiences and good ideas of their colleagues and team members, and they make fewer bad decisions. they see increased motivation of team members because the team members know better what to achieve in the short and long term. By doing so, they put the T.E.A.M. concept into practice, i.e., Together Each Achieves More.

7.7 Audit versus Performance management

In some organizations people don't distinguish between audit and performance management. In an audit one evaluates the actual situation and makes an audit report. This is a *static* approach; you find observations from which you can learn, i.e., you improve the situation by taking corrective actions.

In performance management you manage a key process. In a weekly or monthly meeting the situation is discussed between the owner of the KPI, his colleagues and/or team members. Step-by-step the results improve towards the set target. This is a *dynamic* approach. **Monitoring a KPI** consists of the following steps: collect data, transform the data in a measurement point, interpret the graph, discuss the graph with the team, make a decision, establish an action plan and finally put this action plan into practice. Subsequently the cycle starts again from the beginning in collecting data.

7.8 Evidence-based management versus fake news

"Fake news" is real. One can find an abundance of fake news in the social media. Typical characteristic of fake news is the *absence of rational thinking* and *absence of evidence* which can prove the statements. The person who expresses fake news, makes use of *emotions* instead of reason. When KPIs are well managed, the owner should show *evidence* of the propositions he or she makes. He will be *factual,* and decisions are based on facts and figures. By doing so, the society will have less tendency to become polarized.

7.9 Cost management versus cost cutting

In most cases the budget is a limiting factor. Some senior managers think that the easiest and the most effective way to be within the budget is to cut costs. Perhaps you can gain some money in the short term, but in the long run it will turn out to be a bad decision. Team motivation drops and the key process doesn't deliver the expected results.

The key process will deliver planned results only when the key process is managed in a professional way. Continuous improvement must be applied.

8. Pitfalls and solutions

Finally, we'll describe some common pitfalls in the use of KPIs. The list below can be used as a checklist by any leader to evaluate the quality of his KPI.

Common mistakes when using KPIs:

- The objective to be achieved is not complete described. The better the objectives are defined, the better the results are. If the objective to be achieved is described vaguely and superficially, the results are usually meager.
- The target value is not indicated in the graph or table. You are then dealing with a statistic and not an indicator.
- The results of this indicator are not connected with higher goals such as the strategic plan of the organization or the strategic objectives of a higher hierarchical level.
- Little or no evolution can be seen in the KPI. For example, the KPI is not updated for three months in a row. This is a signal that the KPI is probably not being used in daily management.
- The KPI is infrequently monitored, e.g., yearly. In this case you need to develop a leading KPI which tells you monthly how you will achieve the yearly KPI.
- The results are tracked over a short period of time (e.g., one or two years). In order to observe a real *trend*, the results should be presented over a long period of time (e.g., ten years). Reflect on the example of the evolution of the gold price.
- The target value is not adjusted when the target is reached. This shows laziness on the part of the owner of the KPI. A true leader sets a new and ambitious goal.
- The target is reached after three or four measurements. The target value was not ambitious enough. In that case, it is best to gauge the company culture. In a punitive culture, people, including executives and directors, start to "play it safe", i.e., set goals that can easily be achieved. In a constructive organizational culture, where good behavior is rewarded, much more ambitious goals will be set and achieved. To give an idea of the impact of organizational culture: a yearly productivity increase of two percent can be expected in a defensive culture versus a four or more percent increase in a constructive culture.

- Analyzing the KPI with subjective data instead of objective data.
- The KPI shows no segmentation, i.e., there needs to be a sub-KPI per segment. In the case of the example of the city administrator, you need to see the evolution of citizen satisfaction for each of the four questions.
- Leave out the owner's name and position. This is an indication of avoiding responsibility. In this case, it is best that the third party (website visitor) checks the status of *accountability* in this organization. For example, they can check how many KPIs of this AOPS don't mention names and positions. If it is a high percentage, the highest-ranking process owner should be addressed. He is fleeing his responsibility as a leader.
- The owner of the KPI takes a defensive position in response to feedback received. It is expected that the KPI owner used the feedback received from third parties to achieve better results. However, if, in his opinion, the feedback given has no added value, he may choose not to act upon it.
- Our intuition can give a quick answer and interpretation of the results for a given topic. But … intuition isn't always reliable. Both the KPI owner and the third party should be aware of this pitfall. Do we have correct and reliable data?

Example20: Life expectancy

Statement 4 from the book *Factfulness* by Dr Hans Rossling[10] on life expectancy:
Question: What is the life expectancy in the world today: a) 50 years, b) 60 years or c) 70 years?

In 1800, life expectancy in almost every country in the world was about 30 years. In 2017 life expectancy is 72 years and hence c) is the correct answer. Dr Hans Rosling found that most people did not know the correct answer. Among the Norwegian teachers, only 7% knew the correct answer! Many people think intuitively that in many countries the infant mortality rate is very high. Correct application of the SAC-Model helps to find correct and reliable data.

Table 1 lists symptoms and remedies for some common cases of poorly application of KPIs.

Table 1: Symptoms and remedies

Symptom	**Remedy**
Too many KPIs for senior management	Check whether the KPI is an output and outcome KPI or an input and process KPI Check that each KPI is aligned with the vision and strategic plan of the organization Apply the Pareto-principle (80/20) rule. The most important 20% of KPIs deliver 80% of the results. Manage only the 20%.
Difficulty in establishing and measuring the KPI	Manage only KPIs within your circle of influence. Describe first, in detail, what you want to achieve. Then you can create your KPI.
It is hard to distinguish between input, process, output, and outcome KPIs	Start with the description of the key process. Link your indicator and KPIs to the corresponding stages within the key process, i.e., input, process, output, and outcome.
I don't understand why the distinction between output and outcome is important	The output result is the result you obtain after the process activities are completed. The outcome results measure the *impact* of your management of KPIs. This is also the ultimate goal of management of KPI.
Team members resist working	Team members don't see the added value of the KPI. It is up to

with KPIs	the owner of the KPI to explain in detail the reasons for this KPI and how this KPI is aligned with the long-term goals of the organization. Goal achievement becomes a reality only when there is a clear focus for all team members. The leader discusses his KPIs with regular frequency, e.g., monthly, with his team members. He actively applies participative management.
Team members don't participate actively in the achievement of the planned goals	It is possible that the KPI owner is too directive and doesn't allow his collaborators to give suggestions, commit themselves, or put the decisions in practice, etc. This is called a defensive passive organizational culture[11] where people don't take spontaneous initiative. The team members don't understand why they do things. In that case the owner of the KPI should again explain the objective of the KPI, i.e., "What do I (owner of the KPI) want to achieve?"
I have no influence on the objective	You have chosen the wrong KPI. Your decisions and actions need to influence the objective and make progress towards the objective. If not, choose another KPI.

It might be easy to apply each paragraph of this paper. However, the application of all elements of this KPI approach together is extremely difficult. Nevertheless, you can learn how. At the end of every meeting ask what the team can do so the next meeting will be more productive. After a number of months, you'll be astonished at the progress you have made.

The authors wish you good luck and many excellent results.

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[1] SAC-model: Society & Active Citizenship Model
Yves Van Nuland and Grace Duffy, *How well is our country managed?* ASQ Quality Management Forum, Winter 2021, vol 47 number 4.

[2] The focus of the Society and Active Citizenship Model (SAC Model) is management of the whole public sector. There are two categories addressed. One is the general government, agencies who report directly to politicians (e.g., Governor, Minister, Mayor). Examples are governmental organizations like ministries, agencies, departments, regional and local organizations like counties, cities, fire departments, and police stations. The second category includes public service organizations, such as public schools, public universities, not-for-profit organizations, public-private partnerships, and government contractors such as defense and social service suppliers. The latter category consists of organizations which depend on taxpayer funding for at least 50% of their budget through direct payments or grants. When we speak in this article of public sector (AOPS), we always refer to both categories.
Public Service Organizations can be classified based on a variety of criteria such as task, ownership structure, legal status, degree of autonomy, financing and budget structure, distribution of financial surpluses, or 'publicness.' When the organization is more than 50% dependent on tax or social services funding, we call it a public sector organization. This paper refers to these entities as "All Organizations of the Public Sector (AOPS)."

[3] See SAC-model

[4] In the SAC-model, each KPI is mapped into a tree showing how lower-level indicators roll up to align and support the eventual key performance indicator to which it is associated.

[5] https://www.finextra.com/pressarticle/77123/kbc-offers-certainty-on-home-loans-in-just-ten-minutes

[6] https://sdgs.un.org/goals

[7] https://www.staceybarr.com/measure-up/

[8] Yves Van Nuland and Grace L. Duffy, *Professional Process Management*,
The Quality Management Forum, (2019) vol 45 number 4 p5-12

[9] Masaaki Imai, Kaizen, *The Key to Japan's Competitive Success*, Mc Graw Hill (New York) (1986)
ISBN 0-07-554332-

[10] Hans Rosling, *Factfulness: ten reasons we're wrong about the world - and why things are better than you think* Hachette Collections (2019) ISBN 978-1473637498

[11] *Organizational Culture Inventory*, https://www.humansynergistics.com

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