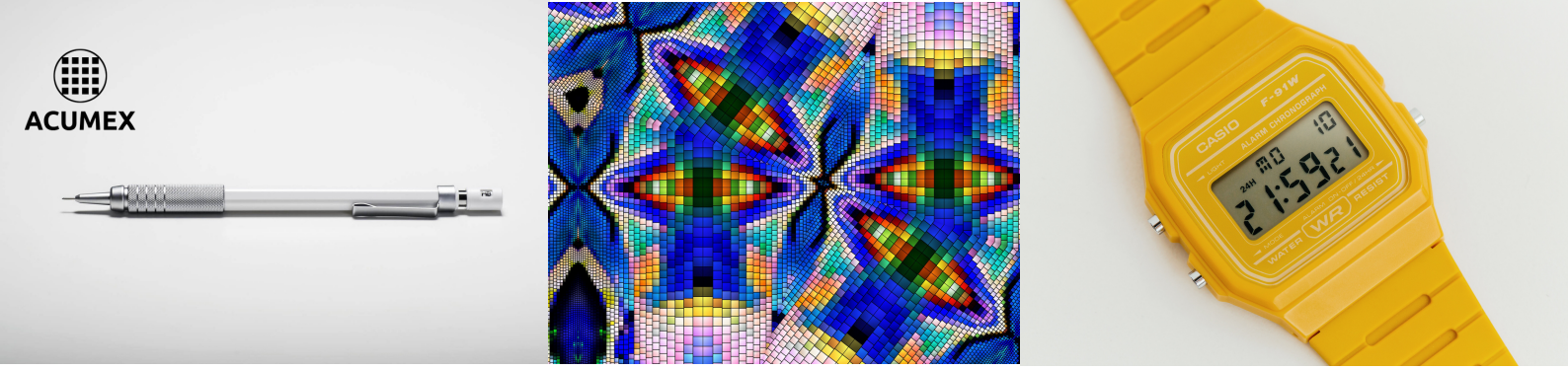


A pencil and paper guide to digital transformation

It may seem ironic to use digital media to talk about digital transformation and then call it a pencil and paper approach, but there is a rationale behind the madness. My limited drawing capabilities forces me to think carefully about what to draw. It has to be **simple**. There are plenty of ways to complicate things (some people make a living from that), but when we stick to basic principles, they can work as a guide, when things get more complicated.

Let's get started and, another silly idea, let's take business first, so that we can end with digital first (if you have seen Christopher Nolan's movie Tenet, you will know, this makes perfect sense).

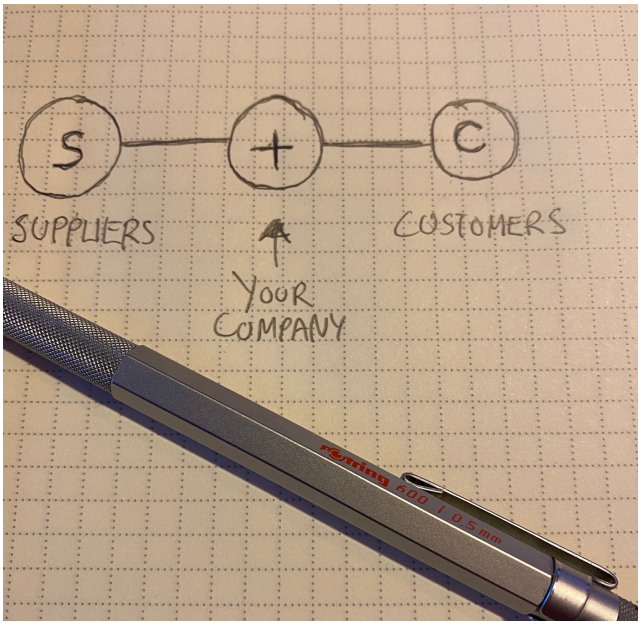
In the beginning there was business

The simple origin

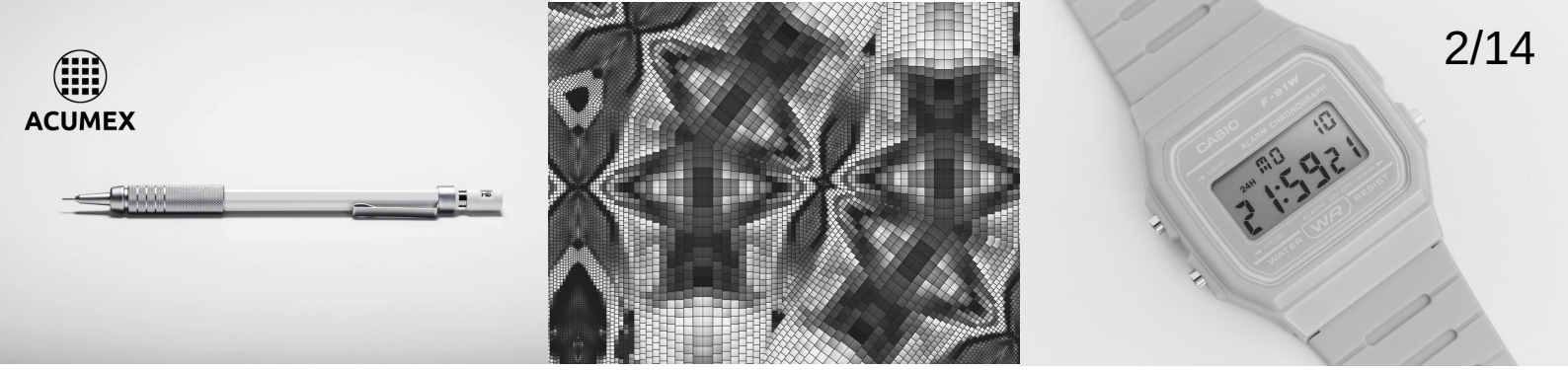
In its most raw and simplistic form your business can be described like this:

1. You buy something from your suppliers (**input** to your company)
2. You do a lot of things inside your company to create value (the **added value** step)
3. You sell something to your customers (**output** from your company)

This can be drawn like this:



First published as a 3 part article series on Linkedin and adapted to a sinlge document here. The guide is meant for inspiration. For specific questions realting to your business feel free to contact us at info@acumex.net.



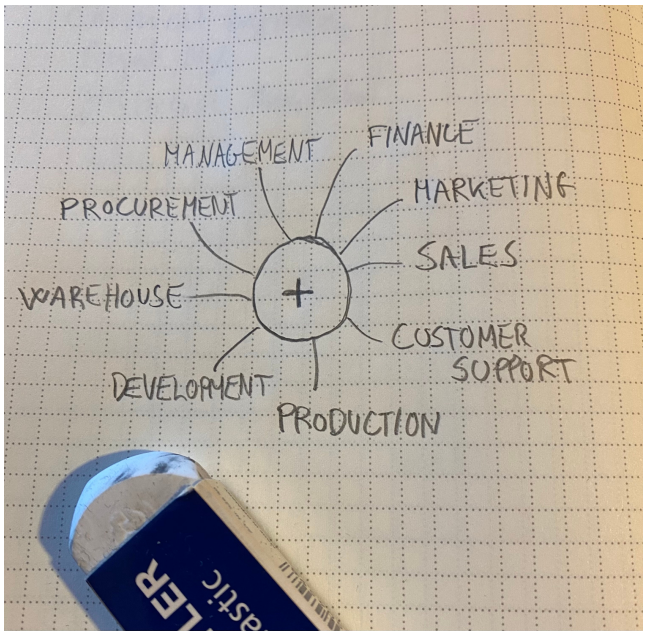
The things you buy and sell can be both products and services, physical or digital, and most likely it is a mix. That depends entirely on your line of business. The circle with the + symbolizes the added-value. This is too simplistic to be operational, but it serves as a reminder, that in the end (as in the beginning) it all comes down to this simple question:

> Do our activities create value with our suppliers, so that we efficiently and effectively add value in our operations and therefore deliver more added value to our customers and do better business?

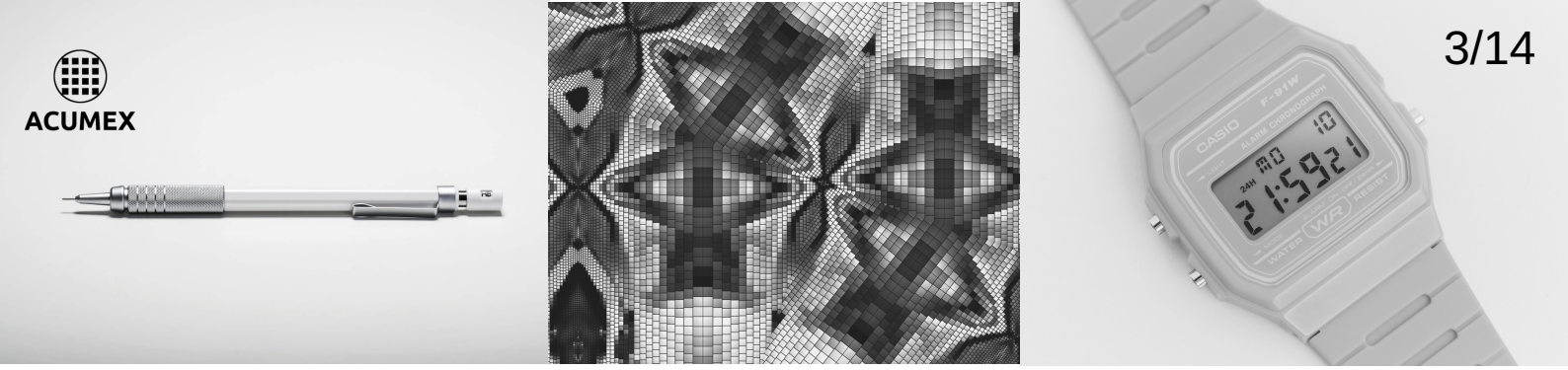
In more complicated models and in real life you will of course find that some activities are there to keep other people happy. They are the stakeholders and should not be neglected, but as mentioned earlier, we can always make things more complicated.

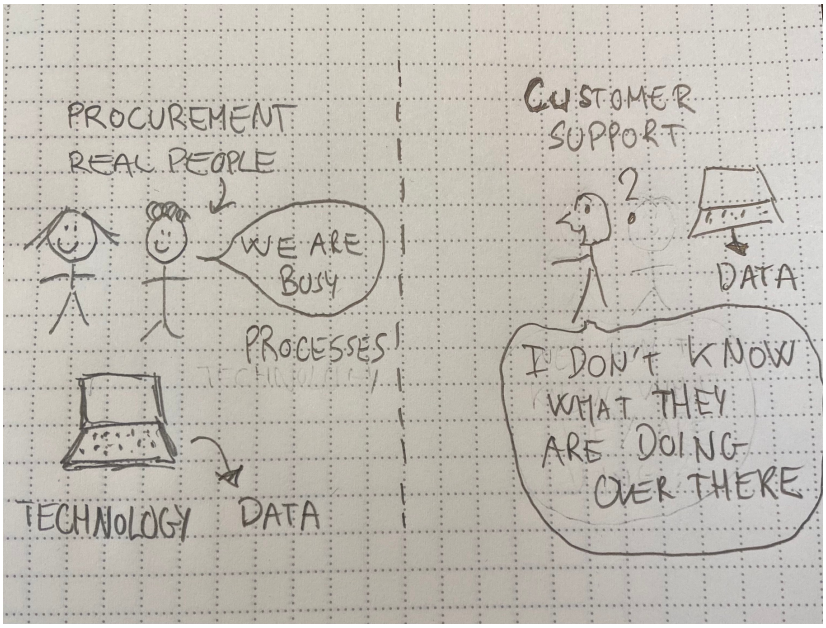
A little more complicated

So let's make things a little more complicated by double-clicking on the circle with the + to look inside. In the analog world I modify the drawing, which takes time and effort, but you only see the outcome (not the technology involved or techniques used). It may seem like magic, but it's not. I hint at one of the tools in the image, but you still don't know how long it took. *Remember this for later*.



Depending on the size and the nature of your company's business, you will perform a number of different tasks inside the company, some of which may be mentioned in the drawing, others not. The tasks are usually organized in functional areas like procurement and if the function is big enough, it may be called a department or a division. This can also be made more complicated, but let's not go there. For now let's consider that these functions are run by real **people** who perform a number of tasks, which make up **processes** and to do this, they use a number of **technologies**. This could look like this:





As you can see I had to make some changes to my drawing in the process. That is **an iterative innovation process, where step by step we get to a better result.** *Remember this for later*.

The procurement people are busy running their tasks completing procurement processes using various tools and storing data relating to these processes. The friendly person in customer support (they are ALWAYS friendly) is also busy, but right now he is wondering about, that he doesn't know what is going on in procurement. Normally he wouldn't think about this, but perhaps he is waiting for something he bought. He will soon forget about the procurement team again. This phenomenon is often referred to as silos.

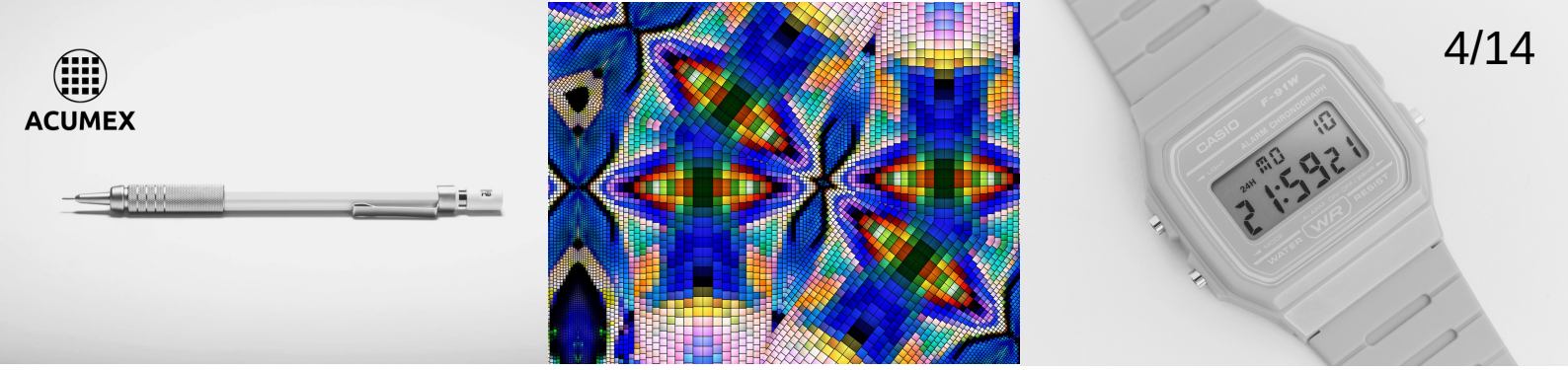
What we have now is a company with real people organised in different functional areas using different tools and different processes. Some tools and processes are shared across functional areas, others not so much. The same goes for data. Actually data can be spread all over the place and this is sometimes the first surprise, when embarking on the digital transformation. Which is where we are heading now.

Digital last, then first and then always

Digital is last, because we wanted to start with the business. The aim of the digital transformation is to get to digital first, which is about the mindset more than the reality. Really, we are aiming for the complete merger of digital and business, so that it is inconceivable to think about one without the other.

You may wonder, where the actual transformation lies? The badly kept secret is data. It is not new, that data keeps you on track and gives you insights into your business. It is not new that the manipulation of data is costly and has been the target for optimization for a long time.

What IS new is that new technologies make it possible to process more data, faster and to deeper levels than ever before giving real-time insights and making it possible to take action on these insights in completely new ways. This again makes it possible to re-purpose data to become an added-value factor and to create new business models based on the data. **In other words: new ways of making money**.



The kaleidoscope of patterns

In this part of our exploration of digital transformation with pencil and paper, we will look at some of the core ideas, which drive the transformation. Again, the aim is to keep it simple and to separate principles from actual technologies. The principles can be compared with a kaleidoscope through which you observe your business. Depending on how you turn it, you will see different patterns and as you gain experience with the patterns you will be able to **see both what your company is and what it can become.**

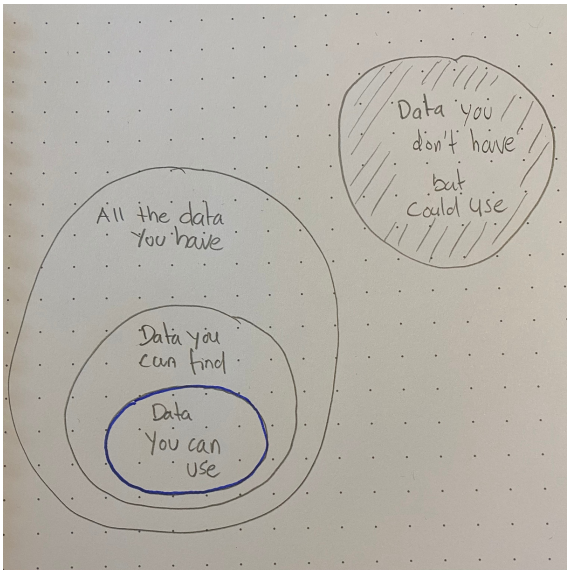
Some key learnings from part 1 were:

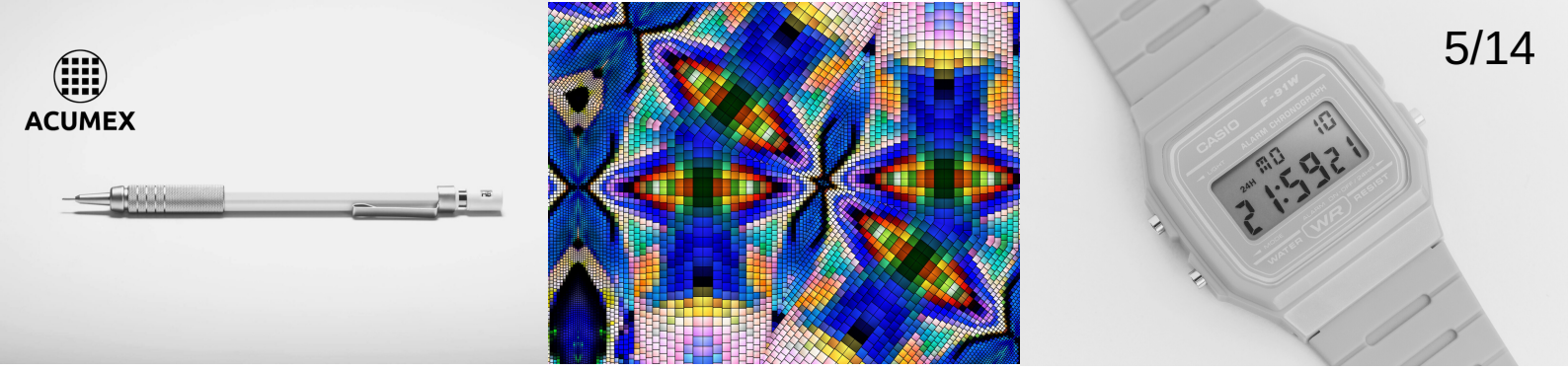
1. Digital transformation is linked to re-purposing your data to improve your business by being more efficient, more effective and by creating new business models, which we explained as new ways of making money.
2. We saw that transformation, whether we change a drawing or a company with new technology, is an iterative step-by-step process.
3. We also saw, that while the final result may look like magic, there is a process of work and experimentation behind it. This process needs to be understood as part of the digital transformation.

It is time to dive into the basic principles, which make up the kaleidoscope to look at your business with: **data, automation, artificial intelligence.**

Data

The digital transformation rotates around data like planets around the Sun. Without the Sun, there can be no life. The same goes for data and digital technologies. One of the business frustrations, when starting with digital transformation, is the gap between "having lots of data" and "having lots of **useful** data, **which we can find**". Many people are surprised to learn, that lots of data is not immediately equivalent to useful data. In a drawing it could look something like this:





If you understand, that data is the fuel for your digital transformation, which again fuels your business transformation leading to increased value creation, then you intuitively understand, that the blue bubble with "data you can use" needs to expand to cover as much of the data you have as possible and it also needs to grow to include the data, you don't have, but can actually use.

Understanding that data is not just data will save many frustrations. *Remember this*.

Being able to find relevant data is not enough to make it usable. The nature and quality of the data is essential. It should come as no surprise, that if data is not digital (for instance if it is stored in paper records), then a first step is to make it digital. Once it is digital it is possible to analyse its quality. The data may contain errors. It may miss data. It may need to be combined with other data sources to make sense. All of this work is part of the preparation for the digital transformation as it helps expand the bubble of usable data.

In short, you want to be in a position, where you have
the right data, in the right place and at the right time.

How you achieve this can vary depending on the application, but the general principle is worth keeping in mind.

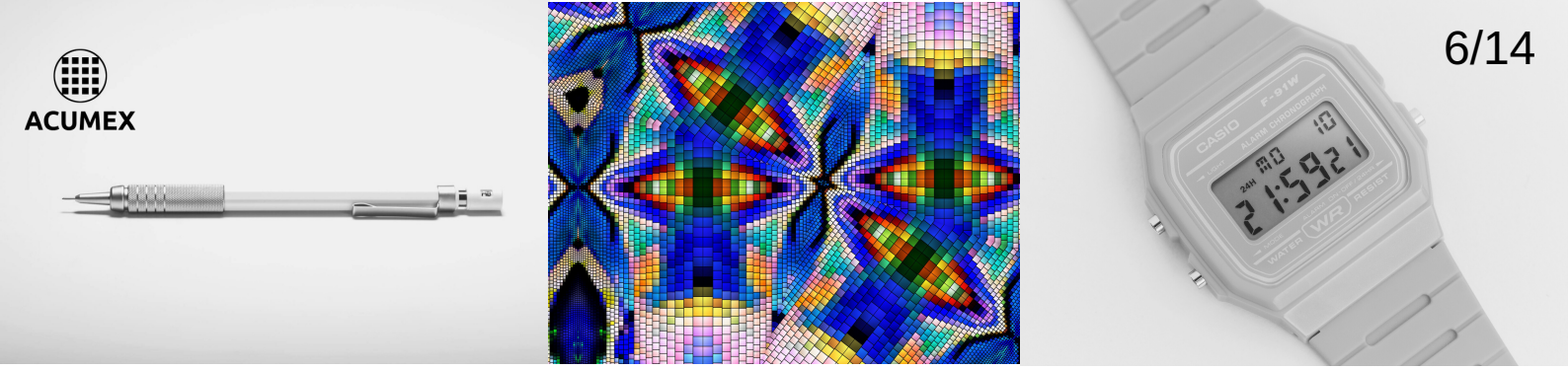
Processes

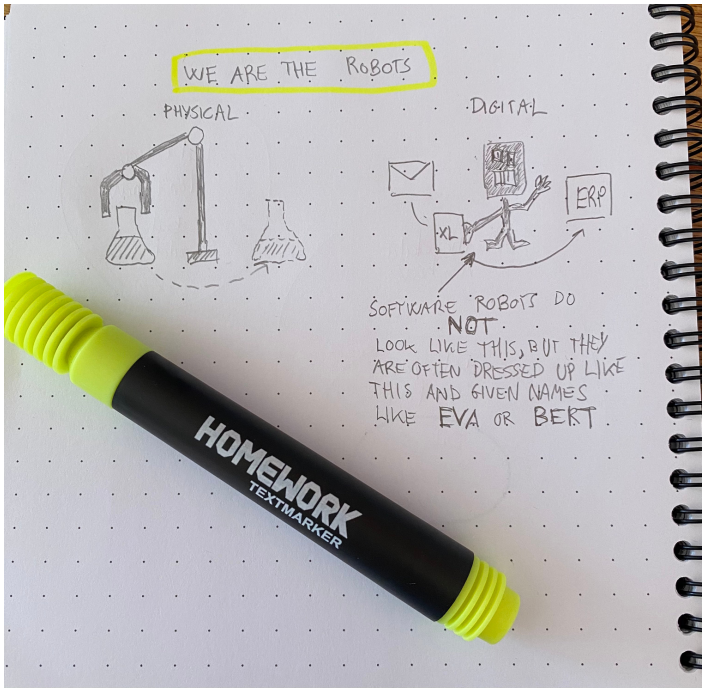
We turn to look at processes. In any company there are hundreds of processes of all sorts. Although processes may be similar between companies (bookkeeping for example) the implementation will vary between them. It is therefore important that you review your own processes, but obviously it is fine to seek inspiration from other implementations.

This is usually the time, when people start getting excited about specific technologies and want to jump directly to different types of solutions. It is however worth it to stay a the level of principles just a little longer, so that you can reflect on the nature of the problem, before reflecting on the nature of the solution. Once again we keep things simple, but let's be clear: it is no problem to make things more complicated, once we leave the level of principles.

Automation

In Bob's Country Bunker (well known from the 1980 movie classic, The Blues Brothers) they play both kinds of music: Country AND Western. When we talk about automation it is often made synonymous with robots and there are two kinds: hardware AND software robots. As you might suspect both for the music and the automation there are more nuances to it than this, but the two types of robots will be enough to illustrate the principle.



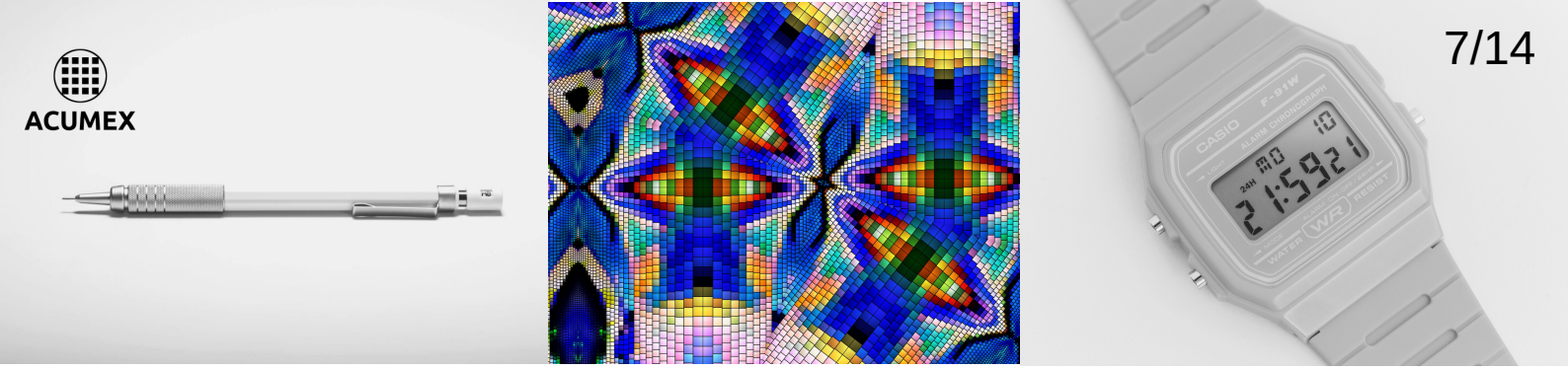


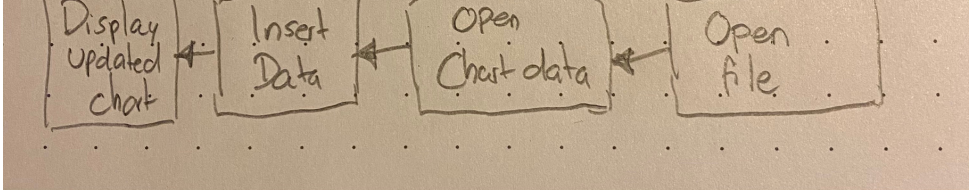
It is difficult to draw a software robot, because it is literally a piece of software hiding somewhere in a computer. It is therefore tempting to draw a kind of imaginary robot like the one on my drawing and make it smile (sort of) and wave to look friendly. Quite often the robots are anthropomorphized and given cute avatars and friendly names like EVA or BERT. But really they are pieces of code, quite similar in principle to the code running the hardware robots. The difference is, that hardware robots have a physical body like an arm, that can grip and move physical things. Software robots do not need a body because they grip and move digital things like files.

The robots can be programmed to do more than gripping and moving things. They can also make changes to the things (both physical and digital things) and the whole process will consist of a sequence of steps. Software robots are often referred to as **Robotic Process Automation (RPA)**, whereas hardware robots are often referred to as ... robots. Or cobots if they are really friendly and work together with you.

Robots of both kinds are really, really good at performing repetitive tasks, which can be broken down into a sequence of steps, which can be converted to instructions for the robots. When you see a process in your current business, which is highly repetitive you have good reason to suspect that this may be a process, that a robot could do. Unless you are moving physcial things around, you also have reason to suspect that it is a software robot you are looking for. Being able to run processes repeatedly and consistently 24/7 is one of robots' superpowers.

Let's look at an example: A task, which can be fairly simple for a human, but tedious to execute, could look like this: Open 100 emails with attachments containing sales reports, copy the sales numbers to a power point file to generate a chart with sales for the 100 points of sale. This instruction has a lot of implicit information, which has to be made explicit for robots (computers) to understand. We are not concerned with writing lines of code or selecting tools to help us, but we are trying to look at our processes from a computer perspective.

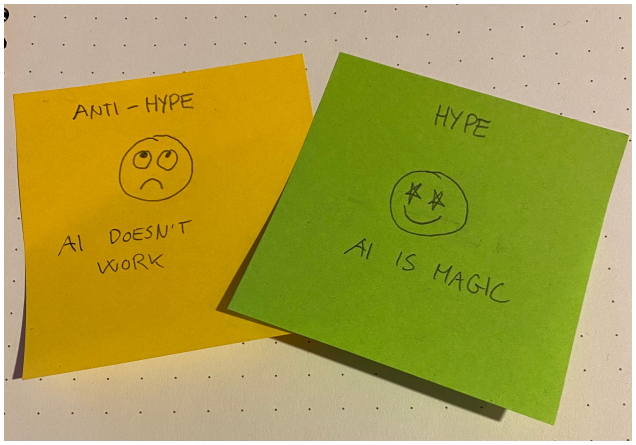


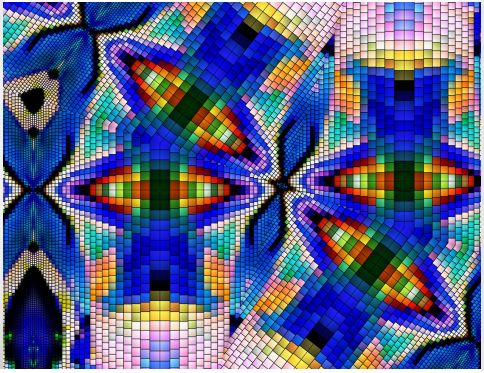


As a first shot, this gives us a pretty good idea about the steps involved in the process. Some of the steps may require more details for a computer to be able to execute them, but we are well on the way. Building the code may take longer for the first email than simply doing the job yourself, but once the code is in place it doesn't matter if there are 10, 100 or 10.000 emails. If you have ever used macros in Excel you will recognize the idea, but new RPA tools have added more power to these tools, which is why some people call them "macros on steroids".In the example, the robot will copy data from cells B2 to B100. This is fine if the data is really in these cells, but if someone happened to have placed the data in C2 to C100, then we would have an error. Much of the effort with robots actually lies in avoiding errors and handling them if they occur. This may require human assistance.

Artificial intelligence (AI)

This is where the rubber hits the tarmac and we enter a land of hype and confusion. But also of amazing opportunities. Where there is hype, there is usually anti-hype. Neither of them is helpful for the simple approach to digital transformation, but they are worth knowing, so that you can recognize them.



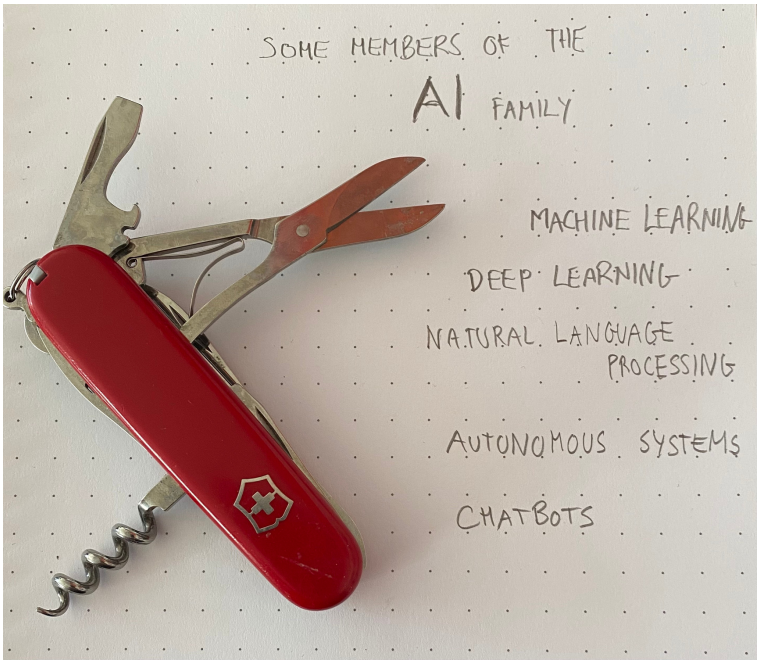


The field of AI moves very fast, which means there is a continuous stream of groundbreaking news from all corners and it is very difficult to make sense of that in a business context. This creates the feeling of hype and confusion. Demonstrations of the latest achievements in the field can look and feel stunning, almost like magic, but of course reality is different. But the anti-hype is not productive either. Some people have given the hyped AI a go, didn't get the results they expected (for whatever reason) and now feel that it doesn't work. This can prevent companies from experimenting with these powerful technologies and getting truly transformative results.

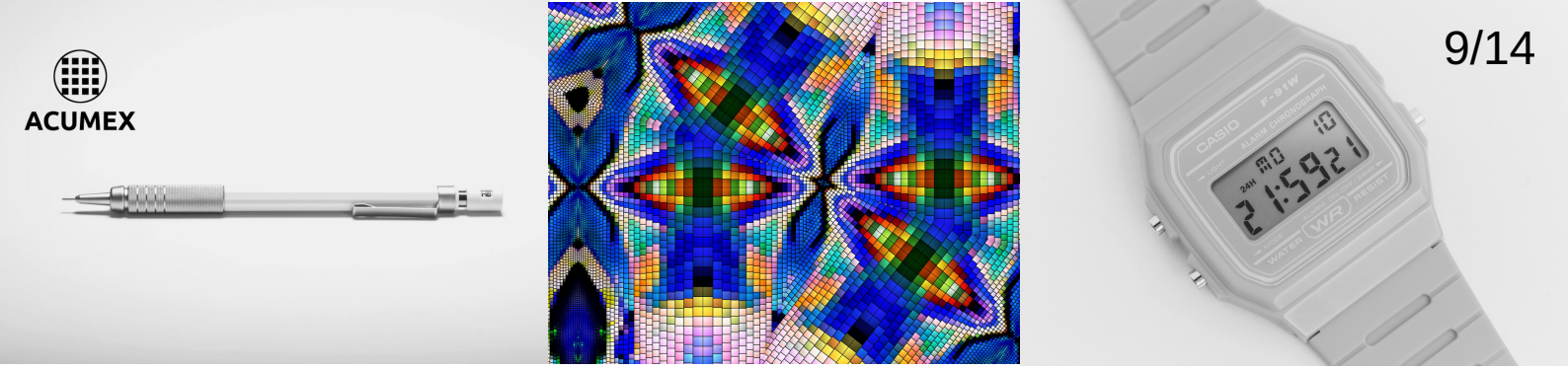
The trick is to think about, why you would even want to apply AI. How will it make your business better? Don't be confused by the latest news. It is a distraction, just like the one magicians use to make rabbits disappear. Focus on the work to be done. *Remember this*.

AI is a collection of tools

Instead of thinking of AI as light sabre, which can fend of laser beams and cut through all kinds of stuff, it is more practical to think of it as a collection of tools, more like a Swiss army knife, where each tool is useful for certain tasks and useless for others. A few of the most common tools ones are shown here:



It is NOT the aim to explain the different technologies here. As exciting as that rabbit hole may seem, it will lead us astray from the path of a simple focus on the business. We return to the kaleidoscope of patterns. What are we looking for?



Pattern is a key word here. AI is particularly powerful for finding patterns in vast amounts of data, which humans have no chance of finding unaided. This allows it to recognize objects in images, make recommendations for what to buy next, make predictions of what traffic is going to be like, convert spoken words to written language and act on it. In a nutshell this relies on AI's ability to

- **Prioritize** (like Google Search results)
- **Classify** (find out which category something belongs to)
- **Associate** (finding links between data, like what Amazon does to recommend other products)
- **Filter** (finding out what is important for instance when talking to a digital assistant)

Hannah Fry's book "Hello World." is full of great examples of these different principles, what they are good for and not so good. Recommended reading for anyone.Another key word is learning. Some AI models are built on rules, which are pre-defined and then subsequently refined by learning from data. These models are often designed in a way to collect the data they need during use, which means they do not depend on your historic data and rather learn going forward. Other tools (most of them) are based on machine learning, where the model is built by learning from patterns in the data and this is why,having the right data, in the right place at the right time becomes more critical than ever. Simply put: bad data gives a bad model. The learning element means that AI models continue to improve and refine their understanding of the world. This distinguishes them from robots, which need new instructions to refine their capabilities.

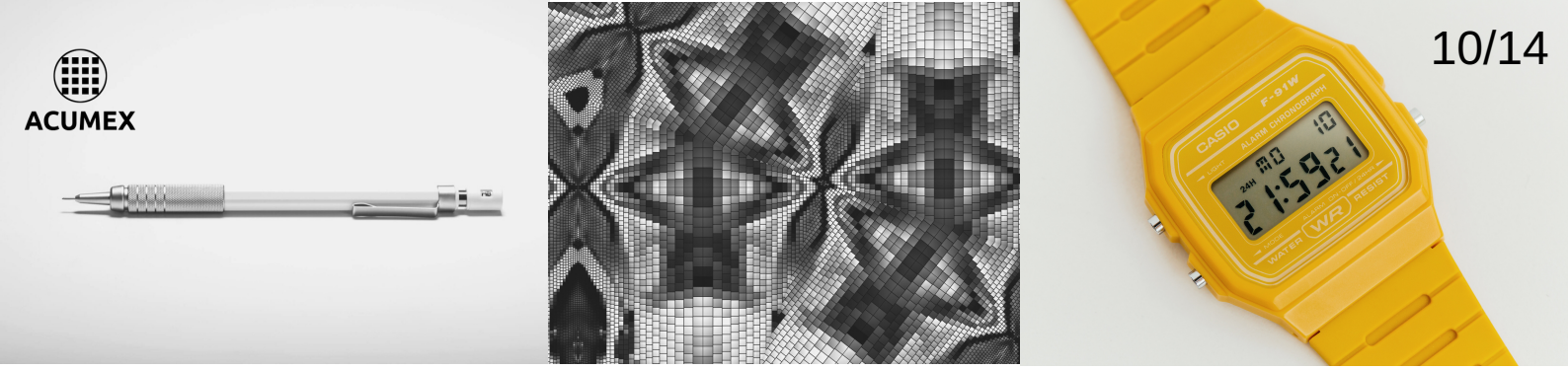
The AI algorithms can be powerful in themselves, but will be even more powerful when **combined**. They can so to speak work together. An algorithm used to predict the best time to maintain an elevator, could pass on the information to another algorithm, which orders the spare parts and a third algorithm, which books the maintenance company for the optimal time. Some of these processes rely on AI, others on automation with robots. Together they make a very powerful system and this is where we see the glimpse of the digital transformation.

The ability to extract patterns of insights from data at scale and speed and to continuously learn and refine the algorithms' capabilties is one of AI's superpowers. Each AI tool will have it's own superpower and together they make up a kind of League of Superheros.

So, what is the situation now?

We have an organization with real people running hundreds of processes at the speed and capacity of humans supported by some classic technologies. We now introduce some new powerful technologies in the shape of automation and AI, which can extract insights from our existing data (if we have it, can find it and it is in good condition), and we allow these technologies to act on the insights, they have generated. Some processes can now run at the speed and capacity of computers processing more data than any of us can see in a spreadsheet in a split second. As some might say: this changes everything!

With an understanding of the underlying principles of data, automation and artificial intelligence, we are ready to revisit our business with its processes and people and look at it with a digital first mindset. Without looking at a single line of code. Without diving into a specific technology and chasing the hype. It is my claim that all management teams, who know their business processes well, can take a big step forward towards digital transformation by using pencil and paper (or a whiteboard) and a basic, both feet on the ground, understanding of the digital principles. This is what we will explore in the next part.

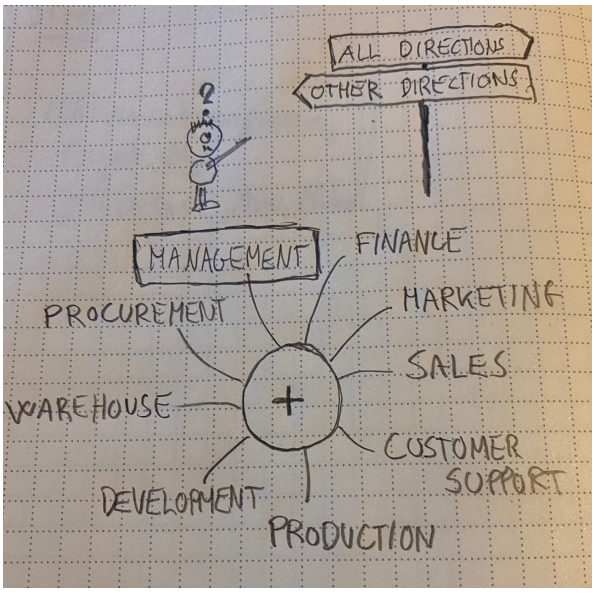


Going to digital first

When Douglas Adams wrote the trilogy called "The Hitch Hiker's Guide to the Galaxy" it ended up having 5 parts. Now that may be put down to bad planning from Douglas Adams' side, but coming from the creator of the Infinite Improbability Drive that seems - well - improbable. It rather suggests, that our solid definitions such as "A normal trilogy has 3 parts" will be challenged by emerging new knowledge and unfolding events - however improbable. A trilogy can now have 5 parts. Unfamiliar and confusing? Yes! Even not-normal! *But that idea can take you anywhere*.

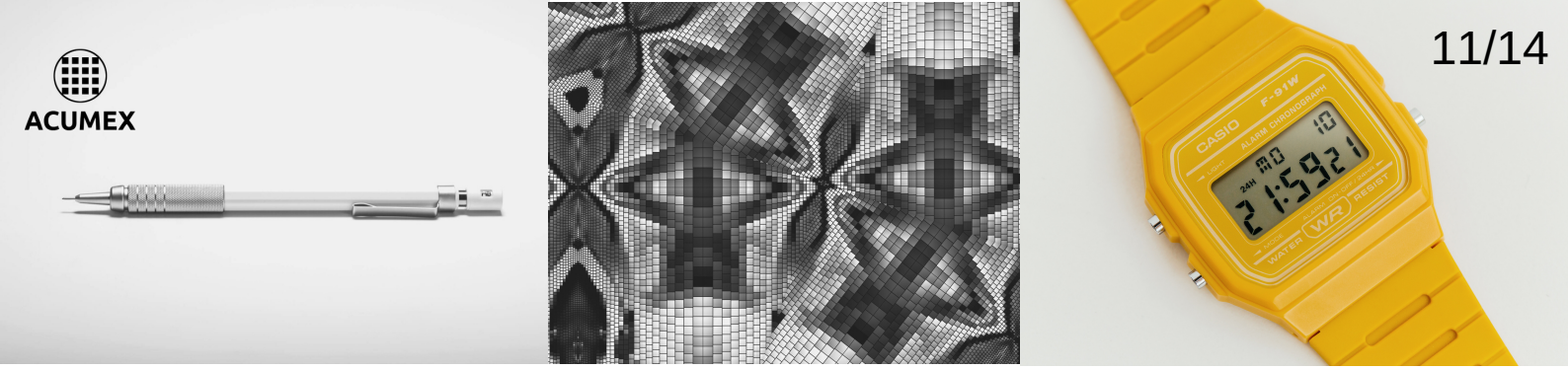
We have reached part 3, the final (?) part, of this Pencil and Paper Guide to Digital Transformation. We have seen (in part 1) how our business is made up of **real people**, thousands of **processes** and many **technologies** and we have seen (in part 2) that we have a collection of tools at our disposal guided by principles of **automation** and **intelligence** powered by data.

It is time to pay a visit to the good old (normal?) business model and look at it with digital first eyes. It is in other words time to "double-click" on the management box in my drawing and ask: if these technologies can take us anywhere, where do we want to go?



Never mind the gap

Gaps occur all the time in organizations. People come and go. The company grows. Tasks change. Technology changes. People spot these gaps all the time and most of the time, they solve them with work-arounds. Nifty spreadsheets sprout everywhere to fix gaps created by technology and/or processes. They also appear because people like to do things their own way. Because people are very, very good at avoiding gaps and fixing the immediate problems with work-arounds, it may take quite a while before anyone notices that things are not working the way they were thought to be working.



It gets worse over time. It is often said, that it is hard to introduce new processes and new technologies. The flip-side of that is, that it is hard to kill old processes and technologies. Some people just liked the old tools and keep using them. Some people "didn't get the memo". Most of the time things move on and the old stuff gets forgotten. It becomes part of the company's sedimentary layers. But somewhere someone still keeps filling in forms or using an old piece of software. A friendly IT-supporter creates some simple work-arounds, because "it is no big deal". And literally no one knows.

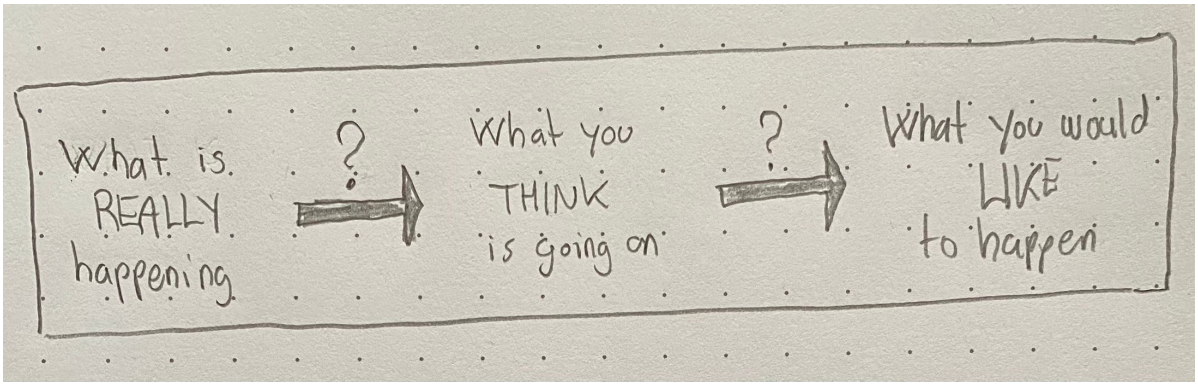
Until you want to do digital transformation!

All these gaps, work-arounds and sedimentary layers keep your company running, but they come at a cost. They slow down processes tremendously. Data and knowledge is hidden in layers of different systems and individual work-arounds. It doesn't matter how fancy your AI technology is, if it depends on a human to find some data in an obsolete system, retrieve a pdf-file, retype the data in Excel, send the file to another person, who feeds it to the algorithm.

Never mind minding the gaps. You need to find them first.

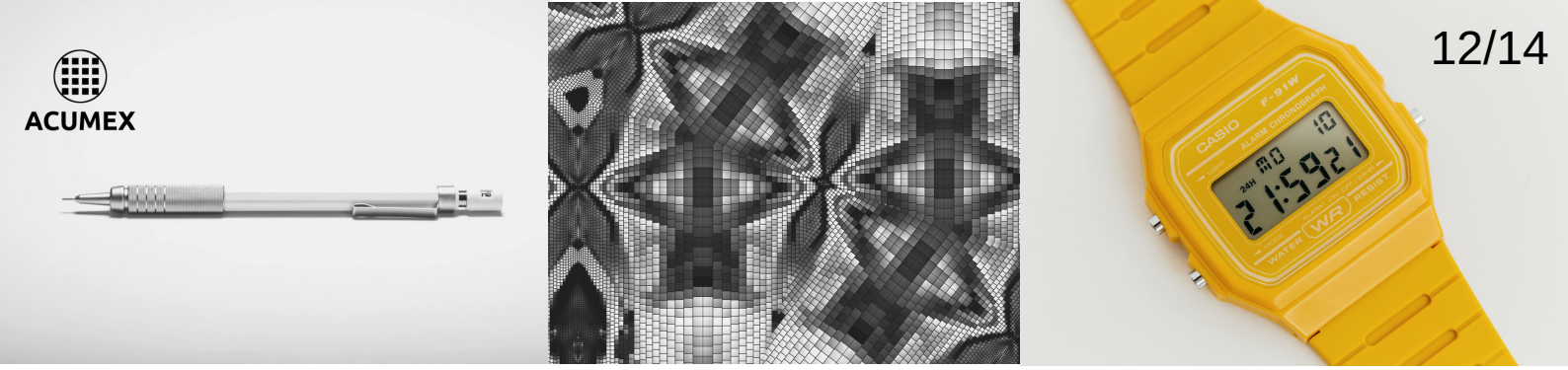
Questions and loops

To get where you want to be you need to bring out your A-game curiosity. You will need your curiosity to work in two directions. You need to be curious about, where you could be with your business and you need to be curious about where you currently are.



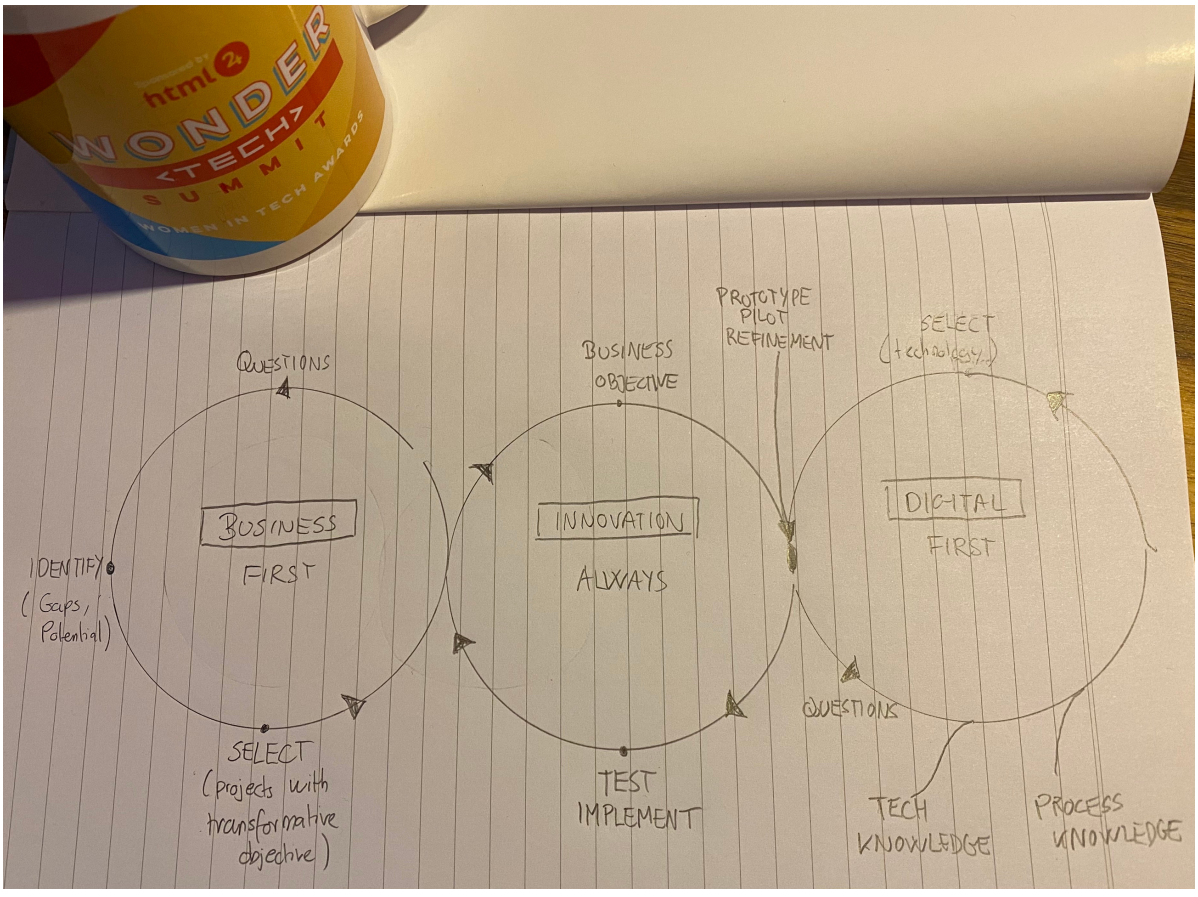
One of the many frustrations on the digital transformation path comes from believing that you start from where you think you are, rather from where you really are.

Apart from the pesky detail about reality, how we think about driving the changes can make all the difference. If we think in linear processes and absolute knowledge (first we must make a full analysis of all the gaps, then we must make a perfect plan for where to go, then acquire all knowledge about new technologies...), then we will surely never get there. In fact it may look both so daunting and expensive a task, that we never get started.

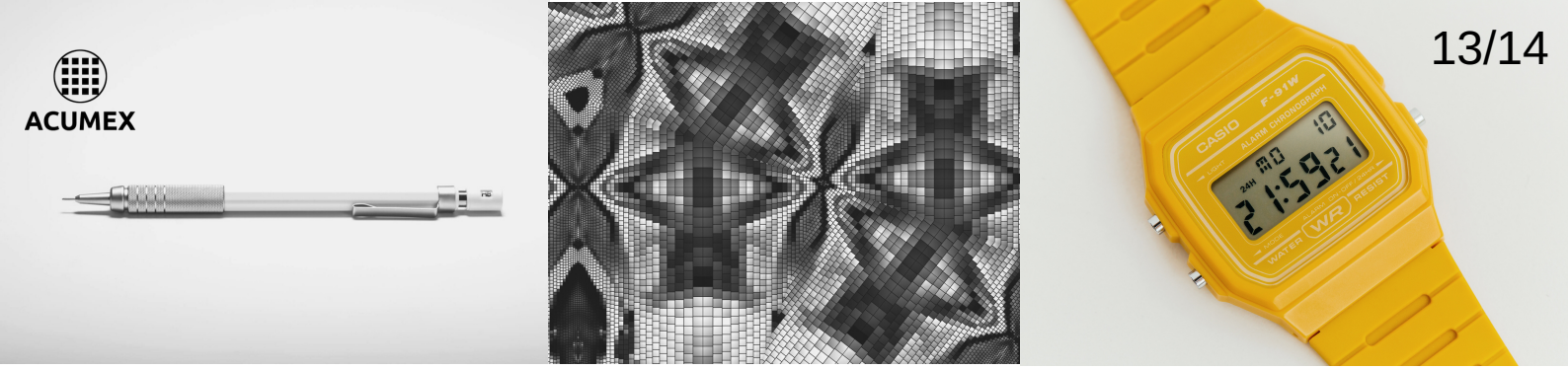


Instead we may want to think in iterative loops, where we gradually test, learn and implement from small scale to large and then repeat. Why are loops more helpful? Two main reasons: **1.** The technologies, we are looking to implement are moving targets and learning them once and for all is not possible. We will need to update the knowledge again and again. **2.** The challenges of introducing new technologies, the sedimentary forces and the skill in creating work-arounds apply all the time and while we are introducing new technologies and processes, we need to loop back to the organization again and again to follow the implementation and any unexpected effects.

It could look something like this:



All three loops are about learning. They are connected and they run continuously. Innovation is not a destiny, it is a journey and the digital transformation is part of that journey. As mentioned before, curiosity is the driver, which means questions are key.



The Business First Loop

This loop is about your actual business. This is where you identify gaps and sedimentary layers. Remember, digital technology does not care about organizational boundaries, which in many cases constitute gaps in themselves. It is also where you identify new potential with digital technologies.

What you find will be determined by your questions. A step by step walk through the processes, while paying attention to the details can be very enlightening. If someone says "We move data from here to there" - be sure to dive into the details:

- How is the data moved and how often? (maybe there is an automation potential here)
- Which data is stored? Where and how? (maybe you are missing some data, maybe it is stored in a personal Excel-file)

Look for the work-arounds. Quite often, when people request specific functionality from software it is because they want to run their work-arounds more efficiently. It is a better idea to digitalize the real process, rather than the work-around.

This is a good place to start, because you will identify processes, which can be automatized and you will probably find various shortcomings in data. You may also find issues, which can be fixed without any new technology (for instance killing obsolete technologies and processes for good).

Other kinds of questions can be initiated by exploring the customer journey or your interactions with other companies, such as suppliers. Can the process be smoother, more valuable, more efficient for everyone? Questions like...

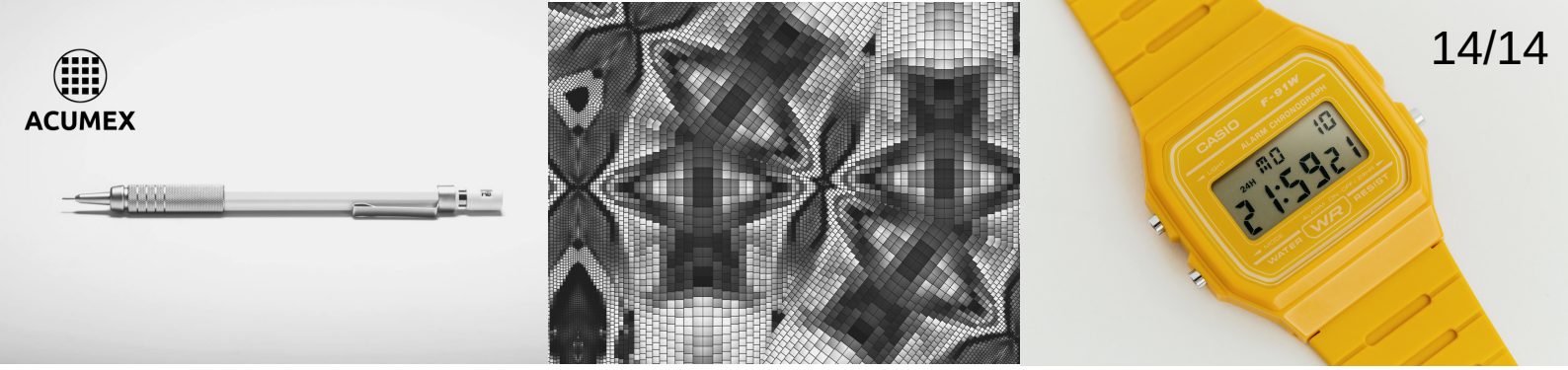
- What if my customers could find Technical Product Data sheets easily 24/7?
- What if I could predict my demand more accurately and involve my suppliers earlier?

...can spark new ideas for improving your business and make you pay attention to different aspects of your business processes. Since new technologies give you more and more power to address such questions it becomes critical to drive your curiosity in that direction. The more you know about the digital technologies, their capabilities and limitations, the better you will be able to identify potential in all your current activities. You may even start to see new ideas for services and products coming out of the digital flow of data. Maybe you can create more value for your customers through data and digitally enhanced services. These questions can lead you to see new business models adding new revenue streams and some resilience to your business.

Which brings us to the next loop.

The Digital First loop

The Digital First loop is both about learning and applying. It is virtually impossible to be an expert in all the new technologies, few people are experts in even one. Fortunately, you do not need to be an expert. You can acquire a lot of high level knowledge from talking with technology providers or consultants. You can attend seminars and learn from cases from other companies. This helps broaden the awareness of which technologies exist and of some of their possible use cases.



Accelerated and true learning comes from applying the knowledge and learning from the results. This is why the Digital First loop intersects with the Innovation loop at the point concerned with pilot projects, prototypes or refinement of earlier implementations.

Identifying a business process as a candidate for a digital process, selecting an appropriate technology to build a solution and then setting up a pilot project is the ideal way to get going and to maximize learning. Testing and adjusting is required, but when the process runs in a satisfactory way it can be implemented as part of normal business processes in which case it returns to the Business First loop as it is now subject to follow up on its business performance for identification of any potential improvements (and to avoid implementation problems, works-arounds etc.).

The learnings from the piloting, testing and implementation are part of the Digital First knowledge and will help ask even better questions from technology providers and consultants.

The Innovation loop

The Innovation loop bridges Business First and Digital First and is really at the centre of it all. Ultimately you want to keep innovating your business and the continuous interaction between digital and business fuel the innovation.

The loops really reflect a mindset, which
favors curiosity, experimentation,
application and learning.

None of the loops represent departments or any specific functions in the organization. Everybody knows something. Some know quite a lot. But no one knows everything. It is essential to bring this knowledge into circulation in the 3 loops. The loops really reflect a mindset, which favors curiosity, experimentation, application and learning. They are open to the outside world, because learning and innovation is a collaboration and all the best knowledge is probably not inside your company.

We opened the session by asking the question "Where do you want to go?" It is an important question and the answer will keep changing as you learn more. Start with the first step and loop back to update your knowledge with your new learnings.Business first? Digital first?

In the end it is innovation first and last - and always.

Conclusion

So there we have it. With pencil and paper and loads of questions to your colleagues you can get started on training your digital transformation mindset. Use your thinking to ask loads of questions to technology providers and consultants to grow your insights into the technologies. And then start experimenting. This is really the crucial point for accelerated learning and while you are learning, you are moving the company forward.

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