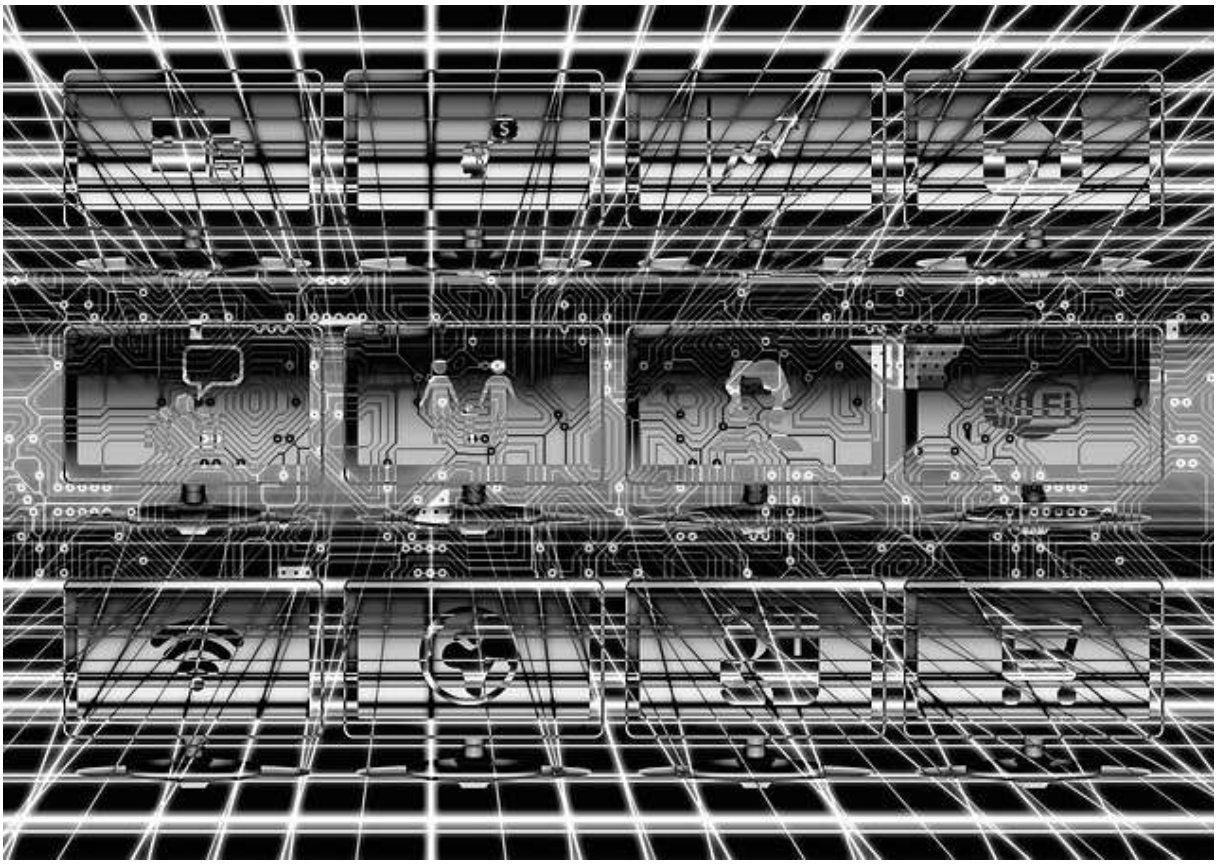
Simplifying IT Complexity



By Maikel Mardjan – July 2020

WHY IT SIMPLIFICATION?

Being in control of IT is needed for every organization that depends on IT technology. So this accounts to all organizations. Every company depends on IT. The dependency of IT is most visible when IT is not working. IT is just like air. You only notice your strong dependency when it is no longer there. But when your business growths, somewhere in time your valuable IT systems and applications become complex. Often because new technology and new interfaces cannot be easily added to your existing applications or website. IT Complexity is a slow growing danger. Complex IT systems have stability, security, reliability, scalability and sometimes even safety challenges. Complex IT system will require more and more of your valuable resources over time. When you feel or know your IT landscape is too complex it is time to take action.

Some advantages of lower IT complexity:

- Lower cost.
- Faster decision making.
- Greater transparency.
- Easier alignment between business and IT.
- Shorten development times for new projects and changes.
- Higher quality IT products and IT steering processes.
- Reduce business risks.

IT simplification is challenging but in the end always profitable. So why wait longer?

This paper is created to get you started with solving your IT complexity problems!

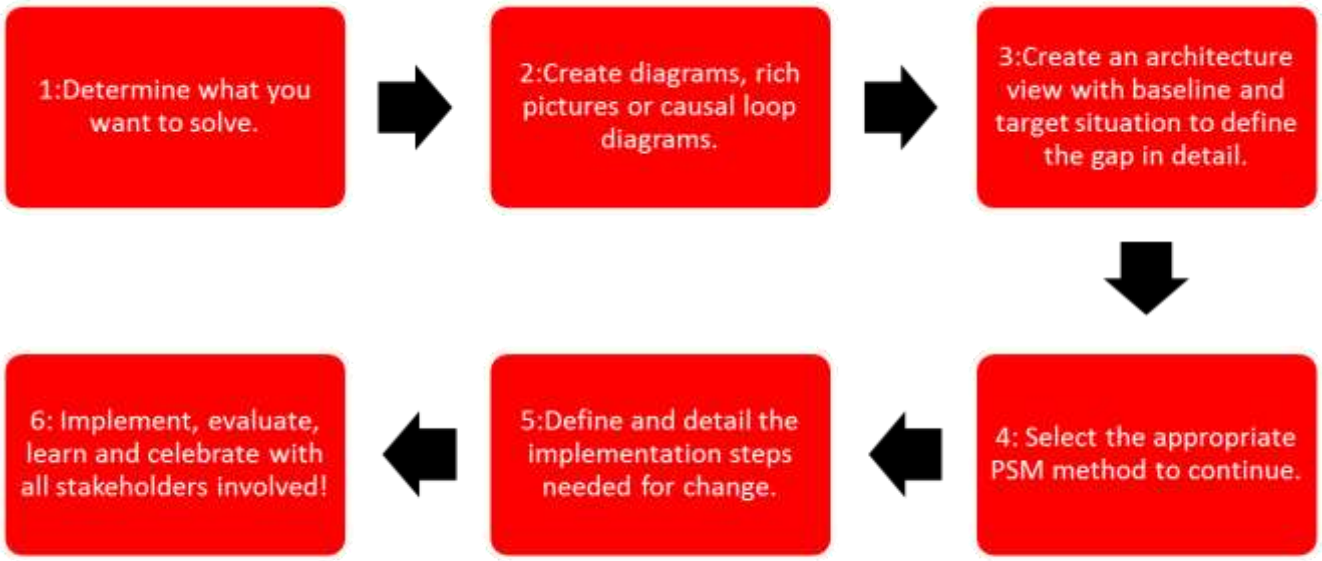
REDUCING IT COMPLEXITY

Reducing your organization IT complexity is a known severe challenge. However, using proven scientific methods that have been applied with success in the past will help.

In basic IT complexity doesn't have to be bad . We love complex technology as long as we have enough trust in the systems. And have enough trust that we or someone else can control and manage the risks involved. E.g. airplanes, medical systems, high speed railway systems and nowadays cars. Dealing with complexity is a matter of trust and accepting risks. However when IT complexity causes severe problems or has huge risk profiles, it is time to take action. Action is best done using systematic steps.

STEPS FOR REDUCING IT COMPLEXITY

In this section some basic steps are defined that can be followed to reduce IT complexity problems. A generic agreed framework for resolving IT complexity problems does not exist. IT complexity problems are very context specific. But on a higher level there are very good scientific frameworks for dealing and solving complex problems. More than 70 years of scientific research on complex problem solving, also known as problem solving methods, gives us a solid foundation on how to approach and solve IT complexity problems. Our generic steps are based on knowledge and experience within IT technology today and proven business problem solving methods from decades of scientific research.


1:Determine what you want to solve.
2:Create diagrams, rich pictures or causal loop diagrams.
3:Create an architecture view with baseline and target situation to define the gap in detail.
4: Select the appropriate PSM method to continue.
5:Define and detail the implementation steps needed for change.
6: Implement, evaluate, learn and celebrate with all stakeholders involved!
Real world
System thinking about the real world

Step 1

- Determine what you want to reduce regarding your IT complexity problem:
- Are your IT cost to high?
- Is the time needed for new functionality or changes too long?
- Do your customers experience to many defects and disturbances? Choosing a single problem is crucial for success.

Step 2

- Create one or more causal maps to get a better understanding of the problem and the options available for reducing the complexity. Visualize the problem using e.g. rich-pictures.

Step 3

- Based on the outcome of step 1, create an architecture overview of your current situation and target (desired situation). In order to develop this architecture view you must perform a deep dive on the context of stated problem. Make sure that the goal you have set for reducing your IT complexity is congruent with the problems investigated. Use system thinking techniques and a system approach and consult subject matter experts.

Step 4

- Based on the characteristics of the problem defined, select an adequate PSM (Problem Solving Method). Continue with the steps of the PSM and iterate or try another PSM if needed. Make sure you have good argument for using or not using a method that takes non-linear effects into account and uses mathematics to determine effects of possible solutions. Mathematics is essential to solving some problems. Crucial in this step is to generate as many potential solutions as possible relate each solution to the causes of the problem. An effective solution is technically feasible within all context specific constraints and is acceptable to all stakeholders.

Step 5

- Define a strategy for implementing the needed changes. When choosing the implementation strategy make sure to take the crucial context and environmental influences into account.

Step 6

- Evaluate the problem solving process and validate that the quality aspects of the new situation in relation to the original defined problem. Share the results with the main stakeholders.

CRITICAL QUESTIONS FOR REDUCING IT COMPLEXITY

Critical questions will help you in the process to reduce your IT complexity. Below a number of critical questions that help you solving your IT complexity problems:

- Do you have a model in place in which you can easily determine the various IT costs against your business products? Direct cost, e.g. licenses or infrastructure hosting are easy to get. But indirect cost that are related to maintenance and quality aspects are much harder to quantify. Of course, many companies use expensive benchmarking methods from famous expensive consultancy companies. However since method and results cannot be easily verified the actual reliability of these outcomes can and must be questioned. Instead of spending more money on benchmarking reports, why not invest in a steering model aimed for your specific organization?

- How much is it worth to reduce your IT complexity problem? Costs can include an investment of time, energy, money, or other resources. Make sure that before reducing the complexity you have a solid business case and are really committed.

- Question assumptions and opinions. Always. IT many experts have strong opinions, but the fact is that truly independent IT advice is scare. Most advisory companies want to sell you a generic solution, instead solving your specific problem. General assumptions do not help when solving your IT complexity problems. Try to make clear what the different perceptions of the involved stakeholders are.

- Do you make use of architecture roadmaps, reference architectures and is every IT project started from a solution architecture? Using an IT Architecture approach in an agile way will save you money and will increase your overall profitability. This accounts for developing and implementing projects and during maintenance.

- Do you take security, privacy and legal aspects into account before developing your IT products? Some crucial non-functional aspects are hard to build in afterwards.

- Do you make extensive use of open source and open standards in a way that can be controlled and benefits your company? Reusing solutions patterns, standards building blocks and build on top IT frameworks can reduce your IT complexity. However be aware that the border between simple and making use of OSS is very fragile and requires deep technical knowledge and a mature IT management organization to be profitable. Standardizing components allows organizations to devote less time to maintaining quality and more to building new functionality.

- Do you focus on stability of interfaces? An interface change can have deep unintended impact. So make sure you have appropriate measurements taken to be able to deal with changes on interface agreements.

- Are you an IT innovation company continuously trying new products? If IT innovation is not your primary business goal, stay away from unproven, untested and unstable building blocks. Be resistant to vendors who promise to solve your IT problems with their product or next version. Miracles will not happen in your IT departments.

- Do you have a quality system in place that encourage continuous improvements that benefits all stakeholders involved? If not the risk exist that your business IT management system remains suboptimal due to different concerns.

TOOLS AND GOOD PRACTICES FOR RESOLVING COMPLEXITY

A silver bullet to reduce IT complexity does not exist. Never. Be aware of typical buzzwords like no-code, cloud driven, robot automation and more. A complex business process requires complicated automation services. Applying a standard approach for your specific situation is not possible. The key of solving business problems is discovering which method has a good fit to solve your problem in your situation. The perfect solution does not exist. Context specific details do matter. So be aware of consultancy firms who try to sell you a proven success method. Business science is continuously evolving and proven methods must meet minimal basic scientific standards. A specific proprietary company method is far away from this.

Some generic tools good practices to get started exist however. We constructed a list of good practices that will help in solving business IT complexity problems.

Some tools for helping understanding the problem:

- Clarify the problem: It is easier to solve a specific problem than a vague one. So clarify the problem before you start looking for a solution.

- Identify key elements of the problem: Problems come to us with varying amounts of important and useless information. Focusing on useless information distracts us and wastes time. Identify the key elements of the problem defined.

- Visualize the problem or a relevant process or situation: Use rich pictures to communicate the problem situation with different stakeholders involved.

- Build a model of the problem: Creating a model of a problem is crucial for reducing complexity. CLD's (Causal Loop Diagrams) are preferred, since the transition from CLD's to a system dynamic stock-flow diagram is easier made. System dynamics will help to get grip on non-linear effects and evaluate best solutions.

- Consider a specific example: Complexity IT problems often come to us in too abstract. Creating more concrete examples can helps to explore the problem more in depth.

- Consider extreme cases: Considering extreme cases can be valuable to determine how serious the problem is.

- Change perspective: Is your customer really concerned with your IT systems and complex management processes? What is crucial to known for outsiders regarding trust into your IT landscape?

- Consider using lean processes. Complicated process with many detailed process steps and (human) dependencies are known to increase complexity. Business science is evolved and matured. Take advantage of proven methods already developed and used many times. E.g. JIT, six sigma, continuous improvement and agile methods for organizing and managing IT development. However analyse of your specific context and evaluating the advantages and disadvantages of every process model is key before starting an implementation.

- Consider ways to reduce uncertainties. Complexity can be amplified by all kind of factors happing outside of your company. Technology innovations, social changes, governmental and regulatory changes can all have a significant impact on the system you need to manage the complexity within your organization. But sometimes it is possible to reduce uncertainty without being cut-off of outside developments. E.g. using architecture and technology roadmaps, creating continuous delivery units instead of using projects for one-time changes.

- Figure out what is hard to change and what the really important 'things' are. Hard to change elements and processes are however not always that difficult to change or adjust. Architecture is and should be one of the things that is hard to change. However instead of changing the architecture proposing implementation changes of the architecture is a very common way to leave an architecture unaffected but to solve many problems.

- Try to discover the root cause of the complexity problem. Is the origin in the design or architecture, or should the root cause be found within the implementation?

- Make a distinguishing between human factors, organizational factors and technology factors. However remain always an integrated system approach since all factors are interconnected and can have causal dependencies with each other in non nonlinear ways.

ABOUT NOCOMPLEXITY.COM

Solving Business IT related challenges for our clients, people and communities in a changing world.

No Complexity.com offers various advanced online (SAAS) tools that support organizations to speed up the steps needed for solving architecture and IT design challenges. Business IT relationships can be complex. We believe in designing simple solutions for current problems to make organizations more robust for future challenges.