

Free and Open Business IT Innovation

An overview of tangible IT trends for 2017



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By Maikel Mardjan

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Introduction

You should be very happy! You are living in a time of accelerating changes happening within the business IT industry. Businesses innovate faster using IT innovations. Faster innovation cycles are enabled by innovations in software, hardware and business science.

Without business IT innovation our world would not be what it is today. Working in the IT industry means you need continuously keep your knowledge up to date. This report will help you and give you a head start for 2017!

Reading internet blogs, magazines, scientific papers and meet with your colleagues and peers is not enough to know what new IT options are available for your innovations in 2017. You need expert input from various directions. This report is created to extend your knowledge on what is hot for 2017 in the area of new emerging IT innovations. The business IT innovation space is complex. New products come with new value propositions and comparison between new technologies is difficult.

This report does not pretend to forecast the future. Until people from the future return to visit us to and tell us what is really going to happen, everyone who claims that he or she can predict the future is at best a very good storyteller. So make sure you protect yourself against false claims! In the appendix of this report we provide a summary of some proven scientific methods. These methods can help you in dealing with innovation challenges from this 2017 forecast in combination of other forecasts and business problems you face in 2017.

This report is all about IT Innovation. Information Technology (IT) is a broad and relatively new landscape. Computer software that automate our work and improves our daily lives on global scale is still rather new. At least when compared to agriculture or construction work. The last 20 years significant progress is made on making IT more human friendly. Due to the advantages with internet communication technologies new products have been introduced that changed the lives of many people on earth.

Innovation is not new and unfortunately it has become a bloated term, however the last 50 years fantastic scientific knowledge is developed on how companies can benefit from each other's innovations and how innovations can influence each other.

This report is no course on IT. This report is also no course on Business IT Innovation. This report is created to be shared. This to give you and your peers great input for your business IT projects in 2017. So share this report with all your colleagues and peers! The license chosen for this publication is cc-by-sa. This means that this report is created to be shared as much of possible. Of course you are absolutely free to make it better and tailor it to your specific context or needs.

What is covered in this report?

This report covers important business IT innovations for 2017. The scope of this report is to outline reusable business IT innovations that meet the following criteria:

1. Innovative new FOSS applications that can be used for your advantage. So, software applications covered in

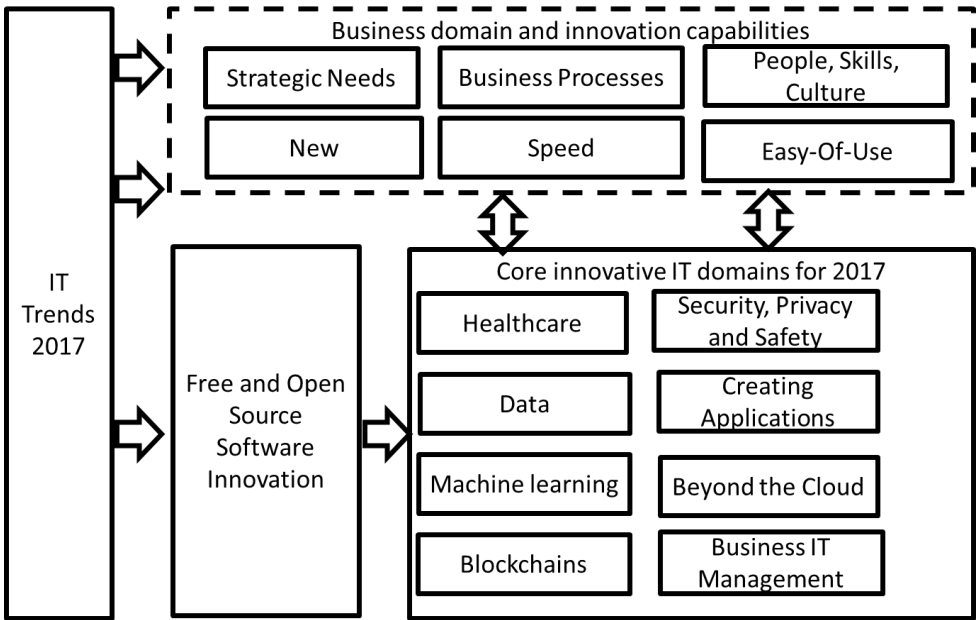
this report are Free and Open Source Software (FOSS *) applications: We strongly believe that many great innovative ideas start in free and open source projects. Open Source projects use a license that makes equal sharing by default possible and encourage collaborations on new ideas.

2. New management concepts for managing business IT processes that are open. So, new management concepts must be published and accessible under an Open license, like the Creative Commons (cc-by) license. This means that proprietary ideas that are legally protected are not taken into account. This because free reuse is often prohibited. To make our world better for everyone we believe in sharing knowledge and sharing ideas. Fortunately, almost all scientist, researchers and companies publish their ideas nowadays under cc-by license. The open access movement for publishing academic knowledge under a cc-by license is almost the de facto standard nowadays.

By using these criteria, you can directly use all innovations mentioned in this report without limitation.

(* When we write Open Source Software or OSS in this report we explicitly mean FOSS as defined by the Free Software Foundation - FSF.org)

This report with a forecast focused on 2017 is aimed towards business IT innovation. This means that subjects selected in this report have a strong relation on how companies (SMB or enterprise) can use or benefit more of new IT innovations.



For many companies managing IT and certainly new IT innovations is still hard and involves many risks. Due to the fact that IT is still not seen as a key business driver the subjects chosen in this report focus on business IT innovations that:

- Create business software faster, better and with less friction.
- Lower IT costs.
- Increase flexibility and changeability.
- Make new business models easier possible.

Is software still eating your world?

Good business IT alignment is business critical for almost every business nowadays. More and more traditional companies like publishers, banks, real estate brokers and governmental organizations are transforming their core business models to take better advantage of new IT possibilities or simply to survive.

As the phrase much heard in the last five years was:

"Software is eating the world"

([Marc Andreessen](#), 2011, Wall Street Journal).

In 2017 you could say:

'Software is eating your company as breakfast'

So if you take your business serious you should not wait with applying business IT innovation until it is too late. In the appendix of this report you will find some tools that can help you on this journey.

Some people like the sexy term disruptive innovation. In reality real disruptive innovations in a mature business IT landscape will always take a few years to have a real disrupting impact. Take for instance the still rather new programming language 'GO' (also called Golang) developed by Google engineers. This language developed in 2009 has definitely already had a large impact on the software programming industry in just a short time (4 years). However, the real impact on the already mature software programming landscape is now beginning to get more visible. So time scales on which new technologies impact our companies should be taken into account when using the term 'disruptive innovation'.

Our definition used for disruptive innovation:

An innovation that creates a new market and value network that disrupts an already existing market and replaces an existing product.

To disrupt a market it is no longer needed to have patents and a large company. Disruption in various markets is possible by using FOSS software and open access to new knowledge.

IT Innovations for 2017

This chapter gives an overview of some great new sexy business IT innovations. These innovations can hit you in 2017 when you are not taken appropriate measurements now.

This chapter outlines important business IT innovation trends for 2017. For every trend real tangible innovative applications are mentioned to expose the options already possible. All projects and applications mentioned are of course FOSS so you can directly build upon them.

1. Healthcare software and health analytics
2. Data
3. Security, privacy and safety revisited
4. Machine learning
5. Beyond the cloud
6. Creating applications
7. Blockchains
8. Business IT management

In the sections below dive into each trend and outline FOSS applications supporting the trend and opportunities that will emerge.

Healthcare software and health analytics

Many countries struggle with growing medical expenses and costs due to emerging new treatments methods. For 2017 the following emerging trends are seen:

- FOSS will be become the standard for EMR(Electronic Medical Records) & hospital systems.
- Due to the rise of nanodevices capable of measuring every aspect of our body an acceleration will be seen for devices that allow FOSS software on their platform into this market. When FOSS applications are used you gain control back on your own valuable healthcare data and you can control how the new device behave. Prevention within healthcare is always better and cheaper than expensive treatments. Opening healthcare data and software platforms will drive data analytics FOSS applications also.
- Due to the rise of use of FOSS software for hospitals and healthcare applications the golden margins of companies supporting and maintaining legacy healthcare systems will be under pressure. With FOSS there is no absolute vendor lock-in anymore. Everyone with the required technical knowledge can support the systems and fix problems. When GPL software is used, the quality will increase and hospitals worldwide will benefit.

The FOSS package to watch in 2017 are:

- Bahmi. Bahmni (<http://www.bahmni.org/>) is an easy-to-use EMR & hospital system. It combines and enhances

existing open source products (like open EMR, see <http://openmrs.org/>) into a single solution. Bahmi is backed and sponsored by a large global consultancy firm (ThoughtWorks Technologies).

- OpenEMR. Already many years present and already used in many countries around the world. Due to having required certifications openEMR has a large base of companies supporting this ERP hospital software. In 2017 a lot of work will go into modernization and creating a new UI that meets today's standards. That is why you will be hearing more from OpenEMR in 2017. The codebase of openEMR is already on php7 so performance for deployments on very large scale are easier and no longer a risk. See <http://www.open-emr.org/> for more information.
- Nightscout. Nightscout is an open source, DIY project that allows real time access to data via personal website, smartwatch viewers, or apps and widgets available for smartphones. The goal of the Nightscout project is to allow remote monitoring of a T1D's glucose level using existing monitoring devices. See <http://www.nightscout.info/> for more information.
- OpenEyes™ an electronic medical record for eye care (http://www.openeyes.org.uk/guide_to_openeyes)

Due to the possibilities of healthcare data measurements and the easy way to configure devices, generate software and store data securely a lot of more Nightscout type of projects will emerge. Governments and hospitals will focus in 2017 more on IT cost and IT quality. This opens possibilities for open business IT healthcare innovations. As result the number of people who will work on FOSS software for healthcare applications will grow. The key with IT innovation within healthcare is that most innovations come from people who are in direct need and are able to create software. Since creating software for complex system is getting easier thanks to good FOSS software the number of healthcare innovations on global scale will increase fast in 2017.

Data

Data and information is key for enabling innovation. But without proper storing and retrieving data is useless and more data will then not make your business more competitive.

With the growth of devices that generate data (Internet Of Everything, IoE) good fast storage solutions are non trivial and are becoming more complex. For 2017 the only thing you need from your vendor will be hardware storage devices. Preferred is of course fast storage and with some minimal quality.

Storage devices in use in 2017 will still be flash and solid state disk devices(SSD's). But tape storage is also still a viable option for archiving large amounts of data fast and cheap. Storing data on DNA cell material is still not a viable option in 2017. But the latest generation of HDD storage based on Shingled Magnetic Recording (SMR) technology will be an enabler for offering very cheap storage in 2017 on large scale. SMR is a magnetic storage data recording technology used in the latest generation of hard disk drives (HDDs) to increase storage density and overall per-drive storage capacity.

Except storage prices to drop at all major cloud and hosting providers in 2017. If they still charge you a significant amount for storage you are definitely customer of a dying company. New hardware storage devices are needed for our still growing demand of data storage needs. To benefit from new hardware devices adjustments of already complex storage solutions is needed. Software defined storage(SDS) FOSS applications will be even more important in 2017. New technologies in storage (hardware and software) are seen as disruptive from a software engineer perspective.

The innovations on data storage that will impact us in 2017 are often offered by the complex software solutions that are build as layers upon hardware storage devices. Think nosql databases, new type of file systems and easier ways to use APIs for distributed cloud storage solutions.

Solutions on the data storage field that you should no longer ignore in 2017 are:

- OpenZFS. ZFS is not new, but due the OSS policy of Oracle open source ZFS developments moved to the OpenZFS Project. The number of participants of this

new formed OSS community increased ZFS quality and ZFS applications. ZFS is a filesystem with superior features. The features of ZFS include protection against data corruption, support for high storage capacities, efficient data compression, snapshots, continuous integrity checking, encryption and automatic repair to name a few. See http://open-zfs.org/wiki/Main_Page for more information. But of course GlusterFS (<https://www.gluster.org/>) is also in 2017 still a good option for many use cases and companies.

- IPFS. InterPlanetary File System (IPFS) is a distributed file system that seeks to connect all computing devices with the same system of files. IPFS is all about storing and retrieving information more easily and in a more efficient way. IPFS can be seen as a content-addressable, peer-to-peer hypermedia distribution protocol. IPFS is more than a distributed filesystem. E.g. it also uses blockchain technology. IPFS can become a new major subsystem of the internet. The creators claim it could complement or replace HTTP. IPFS is already a very large project but in 2017 this project is ready to be used on even larger scale, so it can impact your business too. See <https://ipfs.io/> for more information.
- TSDB's (Time Series Databases). TSDB's are databases that are optimized for time series data. Software with complex logic or business rules and high transaction volume for time series data are not ideal for storing data in a NOSQL or traditional relational database management system (RDBMs). There are a number of

OSS TSBs available like e.g. : Graphite. Graphite collects, stores, and displays time-series data in real time. See <https://graphiteapp.org/> for more information. But you can also take a look at InfluxDB (<https://www.influxdata.com>) or try to get more out of your Elasticsearch installation (see <https://www.elastic.co/>). Elastic is also for 2017 one of the solution you should be aware of if you are dealing with data on very large scale.

- Apache Spark. Apache Spark (<http://spark.apache.org/>) is a general engine for large-scale data processing. Spark can be regarded as an open source cluster computing framework. Sooner or later you're company will do something with own machine learning (ML) in 2017. Then Apache Spark will be your friend since there is Spark MLlib, a distributed machine learning framework on top of Spark Core. Using your collected data and create a valuable ML application is then very simple. Of course Spark still needs to retrieve data somewhere from a distributed file system. So your investments made in Hadoop (HDFS), Cassandra or another NOSQL environments do benefit now. But Spark can also be used with cloud storage from e.g. Amazon S3.

Security, privacy and safety revisited

Security

Due to the continuous rise of our dependency of IT security will remain a hot issue in 2017 again. Almost every day a new company is born that claims to have invented a magic solution to cover all your security risks. Usually a black box solution in the form of an appliance is offered or the company is willing to sell you proprietary software that will solve all your security challenges. And of course the solution is offered cloud based and by monthly subscription. Do NOT fall into this trap! There is no magic bullet for security protection. So also not in 2017. Security risks will always be present no matter how much money you put on the table. This is due to the fact that cybersecurity is a complex business problem since it involves:

- Internet.
- Humans and human behaviour and
- Complex software and hardware

In 2017 more and more companies will notice that security by obscurity is no longer the way forward. And since trust is one of the most important things regarding security applications you need to ask yourself the question: Do you really trust the security software you are using now?

Software has always errors and security software is no exception on this rule. In 2017 your company is able to minimize security risks with lower cost due to an emerging number of very high quality FOSS security packages available.

Privacy

Privacy awareness is growing fast. To protect your data privacy, your customers privacy and all your online activities there is only one solution: Do not share private data. More and more real nasty companies are buying online collected privacy data without your permission. The only solution for real privacy protection is of course stop using malware software (as applications that are not FOSS are called) and demand FOSS software when privacy related data must be shared.

Safety

Safety was for a long time only very relevant for software used in life saving systems and systems where human lives really depend on correct functioning software. Due to the grow of software in all kind of systems and devices we humans use now, like e.g. cars. Internet safety for IT systems will again be a growing field in 2017. We all know that long QA workflows with separate sign-offs delay your design and manufacturing process. Also strong QA workflows and QA control systems do not by definition increase the real safety of your system. Old fashioned standards must be renewed and so safety will be more approached from a risk based perspective in 2017. Yes this means there is a risk that people will die in self driving cars due to design and software errors. But a risk based approach is the only way to speed up IT innovations in many areas where complex machine learning(ML) software systems will be used. E.g. cars, drones and life critical IoT devices.

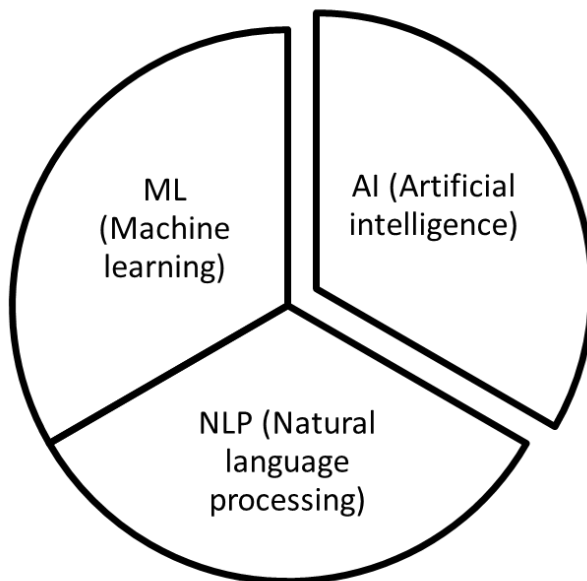
Some FOSS trends worth reviewing are:

- Suricata. A Open Source IDS / IPS / NSM engine. With the growing use of Suricata or other high quality open IDS/IPS systems the market for commercial vendors of black box solutions will decline further in 2017. See <https://suricata-ids.org/> for more information.
- OWASP projects: OWASP is getting and more more presence. Of course due to the openness of the foundation and the real freedom and hacker spirit of members. The software applications released under the OWASP brand have grown significantly in quality and are now usable for more and more companies. Projects to watch are:
 - OWASP DependencyCheck (https://www.owasp.org/index.php/OWASP_Dependency_Check)
 - OWASP Offensive Web Testing Framework (https://www.owasp.org/index.php/OWASP_OWTF)
- Bosun. A FOSS monitoring and alerting system created and supported by Stack Exchange (see <http://bosun.org/>)

Machine learning

Artificial Intelligence (AI) and Machine Learning (ML) are two buzzwords you will be hearing still a lot in 2017. And to make the buzz word confusion complete you should also know what NLP is when reading about AI and ML. So to give some clarity:

- AI (Artificial intelligence) is concerned with solving tasks that are easy for humans but hard for computers.
- NLP (Natural language processing) is the part of AI that has to do with language (usually written).
- ML (Machine learning) is the science of getting computers to act without being explicitly programmed. Machine learning (ML) is basically a learning through doing. Often ML is regarded as a subset of AI.



Also in 2017 there will be no mass unemployment due to AI, but some professions will disappear and roles which demand new skills will emerge. Nobody is really capable of forecasting long term effects on employment for coming 10 years. But making a shift or be part of the next wave of automation is recommended. In general easy and complex knowledge work will be hit by the AI revolution the coming decade.

Machine learning has given us already self-driving cars, speech recognition (using NLP techniques), effective web search, and a vastly improved understanding of the human genome. So much applications seen in the wild are based on ML. Only not yet on large global scale. This is due to the fact that ML needs a lot of data and performs calculations on traditions computers. Both are easily and cheap available in 2017 at large. So expect some shift.

2017 will be the year that a growing number of companies will be releasing AI or ML applications. And the good news is that due to the availability of great FOSS software your company can be one of them by making use of all these new technologies too. So there is no need to use the proprietary IBM Cloud Watson API's or Microsoft Azure ML APIs when you want to create your own use cases for ML.

The following AI/ML/NLP applications are will gain momentum and drive innovation in 2017:

- Apache Spark ML. Spark MLlib is a distributed machine learning framework on top of Spark Core. See <https://spark.apache.org/mllib/> for more information.
- TensorFlow. TensorFlow is an Open Source Software Library for Machine Intelligence. Originally created by Google and used in many Google products it is now

open sourced. TensorFlow has e.g. been used for automated image captioning software (Google photo). See <https://www.tensorflow.org/> for more information.

- Microsoft Cognitive Toolkit (CNTK). This deep learning framework developed by Microsoft Research and was released as OSS in 2016. This CNTK toolkit empowers large and small companies to start working on ML by offering quality apis for many programming languages. And since this project is backed by Microsoft you application can be deployed on Azure. See <https://github.com/Microsoft/CNTK> for more information.

When applying ML for real application in 2017 you will of course create better bots for all your service related task that support your organization. In 2017 bots (also called intelligent conversation agents) are in 2017 an integral part of the digital innovation portfolio. Bots are enabled by strong ML software. But bots which still deliver great value do not have to be that complicated since APIs and services are there already. In 2016 you heard that IBM offers e.g. Watson, Google offers API for its Google Now bot and Microsoft is offering a bot framework. But the best option is of course to use one of the FOSS bot frameworks. So if you want to be independent and still make use of ML you can start simple with your creating your own chat bot.

Use e.g. Chatterbot (<https://github.com/gunthercox/ChatterBot>) FOSS software.

In 2017 ML and bots usage will rise. You or your customers will not be able to tell if your message or call is answered by a human or by a intelligent trained bot. This offers many advantages for companies that want to offer rich 7x24 support. All self respecting tech-companies and tech-consultancy companies should of course create some innovation using the great OSS Hubot software (<https://hubot.github.com/>) or some of its competitors.

Beyond the cloud

Cloud computing will still enable a lot of business IT innovations in 2017. So this section is targeted on how you can innovate using OSS Cloud software in 2017. With the use of IaaS or PaaS services of external providers or building your own dedicated Cloud. However be ware:building your own cloud turned out to be hard again in 2016, also with the use of great OSS Cloud software like Openstack.

Offering your customers cloud SAAS offerings from your own data center facilities has for many companies still many advantages in 2017 compared to going to a (local) Cloud provider. Many local Cloud Service Providers(CSP's) are not real global players and do not offer the Cloud advantages. So you better do it yourself or go to AWS, Azure, Heroku, Google or another major global player.

If you are looking for innovation on your own premises the following FOSS cloud applications are the ones to look at in 2017.

- OSv. OSv is an open source operating system designed for the cloud. OSv APIs for applications, but can also run

unmodified Linux applications (most of Linux's ABI is supported) and in particular it is created to run an unmodified JVM, and applications built on top of a JVM. See <http://osv.io/> for more information. OSv is released in september 2016, is still in beta, but since it used a lot of code of FreeBSD the base will be stable.

- Apache CloudStack. Apache CloudStack is open source software designed to deploy and manage large networks of virtual machines, as a highly available, highly scalable Infrastructure as a Service (IaaS) cloud computing platform. CloudStack had some growing pains in the past but due to the already large amount of users and the stable community you can innovate without risk using Cloudstack. See <https://cloudstack.apache.org/> for more information.
- CoreOS. CoreOS Container Linux is a container operating system, designed to be managed and run at massive scale, with minimal operational overhead. It runs on nearly any platform whether physical, virtual, or private/public cloud. See <https://coreos.com/> for more information.
- Atomic. Project Atomic is an umbrella for many projects related to redesigning the operating system around principles of "immutable infrastructure", using the LDK (Linux, Docker, Kubernetes) stack. This project is sponsored by Red Hat so if you want to take your next steps in 2017 with docker, containers and more take a look at: <http://www.projectatomic.io> Red Hat was not always successful in the past in Cloud and Docker space

and with their OpenShift project, but this project is very promising. So the results of the Atomic project are pushed back to the new OpenShift releases. See <https://www.openshift.org/>

Of course you should make all your infrastructure assets and configuration software defined in 2017. Many great OSS tools are available to support you with this like Terraform (<https://www.terraform.io/>) or Chef Habitat (<https://www.habitat.sh/>).

Creating applications

As long as computers exist people are trying to find ways to create applications easier and faster. From historic point of view the following areas can be distinguished:

- Make software that can solve a real problem instead of creating a system and software that can be used for problem solving. Currently a lot of AI projects are heading this road. In the past 5GL was promising.
- Create a model that humans can understand and use a 'magic' button to automate the creation of full working software out of your model. You can read a lot of the rise and fall of Model Driven Architectures (MDA), 4GL or Business Process Model (BPMN) execution engine software and other attempts to get this fully working. In some areas where changes are easily manageable this attempt is very successful. However too many projects and companies failed trying this road.

So the Software Defined Business (SdB) is still more a fad than actually a real possibility. Also in 2017.

- Create better tools to create software faster and better all from an software engineering bottom-up approach. So make use of services, cloud services, open data. Key is to use tools and architecture concepts that are simpler more productive.

Within the software creation world new ideas rise and fall every two years. Only really new solutions or tools that solve a real problem survive. So within the area of creating applications easier and better you can easily find hundreds of new and promising tools every week. Even if you limit yourself to OSS tools only. Within this innovation publication for 2017 we highlight what we think are new and promising tools to use for your business in 2017.

- React. React was new and sexy. Then it turned out to be not so easy after all. But now with lot of new tools, tutorials, libraries and good improvements available React will be a framework to use if you are building complex web based UI applications. See <https://facebook.github.io/react/> for more information. And yes the world of Javascript frameworks will be expanding even in 2017. In 2016 a new Javascript framework appeared at least every week. In 2017 you better stick to one that has already shown some maturity for your new project before diving in a new one and lose valuable time. So for SPA (Single Page Application) frameworks that are used in almost all new innovative products you should still evaluate how

Angular2, Riot, Ember, Meteor, Ionic, Aurelia, Knockout and of course React match on your specific use case. And still maintenance counts! Where Angular is more used by enterprises new companies that need real speed and want to avoid the complexity that comes with Angular2 or React go for VueJS (<http://vuejs.org>) in 2017. VueJS is clean, mean and ready for 2017.

- Rust. Rust is a new programming language which unlike GO (<https://golang.org/>) brings more than just a better C or C++. GO is definitely a good language and very good to get started with. Even in 2017. You get the performance of C++ without a lot of complexity, but with great new innovation build-in. But when you are into programming and want to do real innovation on this level in 2017 you should take a look at Rust. If not in 2017, Rust will get more popular when tools and frameworks will be created. Mozilla is using Rust to improve the Firefox browser, so there should be something in it for more companies that deal with complex software that must perform. See: <https://www.rust-lang.org/en-US/>
- Serverless Application frameworks. Yes Serverless frameworks will be the next-big thing in the IT landscape. Of course driven by AWS. The unique concept of using Serverless applications at an external Cloud provider is that you are only charged when your application runs. E.g. when your application receives an event. So this model could easily disrupt business models of major hosting companies. But as often with

great software ideas put on the market: Why use a partly non FOSS solution if you can have full control of this great concept by using your own an OSS Serverless Application framework? Multiple real FOSS Serverless solutions are available when you want the advantages of the Serverless architecture concepts, but do not want the vendor lock-in. Promising in this category is Iron (see <https://www.iron.io/>). Or if you are already more familiar with Kubernetes you should start with looking at Fission, see <http://fission.io/>

Unfortunately also for 2017 there is still no magic way to build a new complex business IT system from scratch. But the must do's for 2017 are still:

- Create a good UI that your users love and is enabled with HTML5 to work on any device possible.
- Use services, micro services and decouple your UI from complex business logic.
- Design your system using good old architecture principles to make sure time is spent well, costs are controlled and security is built in from the start.
- Make use of FOSS frameworks and make sure your value is portable. So make sure your business data and your business rules can be reused to create a new system next year!
- Automate every step possible in your application build process, from development till deployment, to increase stability and increase the speed of your IT delivery process. Of course you should use FOSS tools for this. Use some decent framework to avoid losing time like

Chef (<https://www.chef.io/>), Ansible (<https://www.ansible.com/>) or SaltStack (<https://saltstack.com/>). All these IT deployment frameworks are key tools to innovate faster.

Blockchains

Not only the cool guys can take advantage of what is still considered as the next big thing for coming years. In 2017 it is the highest time for you to get started with business pilots to test use cases based on blockchain technology. This section outlines some great FOSS projects that give you a head start. But of course, you can also join a FOSS blockchain initiative that is already a bit more mature and crowded with companies that have a lot of new fascinating ideas like the Ethereum (<https://www.ethereum.org/>) project. Or check the new economy emerging at OpenBazaar (<https://openbazaar.org/>) and ask yourself the question: Why are you still not present there?

If you want to create your own use case and take the advantages of blockchain technology for your business take a look at the Hyperledger project. The Hyperledger project is an open source collaborative effort created to advance cross-industry blockchain technologies. It is a global collaboration including leaders in finance, banking, Internet of Things, supply chains, manufacturing and Technology. This project is backed by the Linux Foundation, see <https://www.hyperledger.org/> for more information.

Building even more from scratch is also possible and when using a good OSS Blockchain framework not hard at all. You can e.g. use the Intel Sawtooth Lake project code. See: <http://intelledger.github.io/> for more information.

If your company wants to test own developed use cases fast check the Dragonchain project. The Dragonchain blockchain platform will get more traction in 2017. So if you want to move early to get your new ideas running before it is 2018 jump on this project now. See <https://dragonchain.github.io/> . This project has also great documentation to learn all dirty details fast on how things really work with the blockchain technology. This project is backed by Disney so it is not a one man's project, but already mature enough to start.

Business IT management

If you have a role as business IT manager the good news is that agile is already over the hype and dying once again. More and more companies jumping on a new sexy agile approach like scrum, lean or devops will notice that the hard complex problems are still hard to solve. And an agile way of working is often not a solution for every problem concerned with people, business, processes and IT technology. In 2017 many more (scientific) papers, most case studies, will be published stating IT management is still hard and complex and agile approaches will not solve these hard wicked problems. But what is the thing to do than for 2017?

In 2017 you should apply the right approach for the challenges you want to solve. This is hard since there is no one size fits all or a magic solution. A one size fits all management solution for all your business IT projects will not make your business IT projects successful. Sometimes even the old fashioned waterfall methods will be applied again. Especially when security, privacy and safety are of uttermost importance. Really new management methods will not be 'invented' in 2017. But beware of new terms given too good old concepts that will be polished up again. With the following range of good old management approaches you should be ready to make your business IT innovation projects successful:

1. Solution based thinking.
2. Group problem solving and Soft Systems Methodology.
3. Agile approaches based on social technique principles.
So devops but human centric and fully process oriented.

Appendix: Help!

This “Free and Open Business IT Innovation 2017” report is created to be shared as much as possible. So please:

Share this report!

Within this Business IT Innovation 2017 report terms, definitions, concepts and jargon is used that can be new or confusing for you. However we realize that this publication is flued with typical IT jargon that you want to be explained. We are open to answer your questions, give a presentation at your company or seminar to explain the business IT Innovation trends captured in this report.

We think your complex business IT challenges for 2017 should be aligned with IT innovations possible. Do not hesitate to ask for help at one of the sponsors of the Business Management Support Foundation.

Platinum Sponsor: No complexity.com
(<https://nocomplexity.com>)



Contact : info@nocomplexity.com
On Twitter : @nocomplexity

Appendix: Forecasting the future

Since forecasting the future is in principle impossible you should be keen on false claims. This section outlines some proven open scientific methods that are usable to deal with possible future events. For every company it is crucial to be able to:

1. Adapt to future events that can impact your business model.
2. Built-in some flexibility in your product, services and daily operations to be a bit more resilience for events.
3. Use new technologies to optimize your business or adjust your business plans to expand more easily.

Of course every mature business needs to do some short and long term planning. And since resources like time, money and good people are always limited you better use good decent transparent tools to open your business for new innovations that can target you.

Below a summary of some of the best tools that you can use to solve and manage your problems that are related to unknown future events. And since knowing what the impact of future trends exactly will be is impossible you really should play with some of these tools.

Scenario thinking

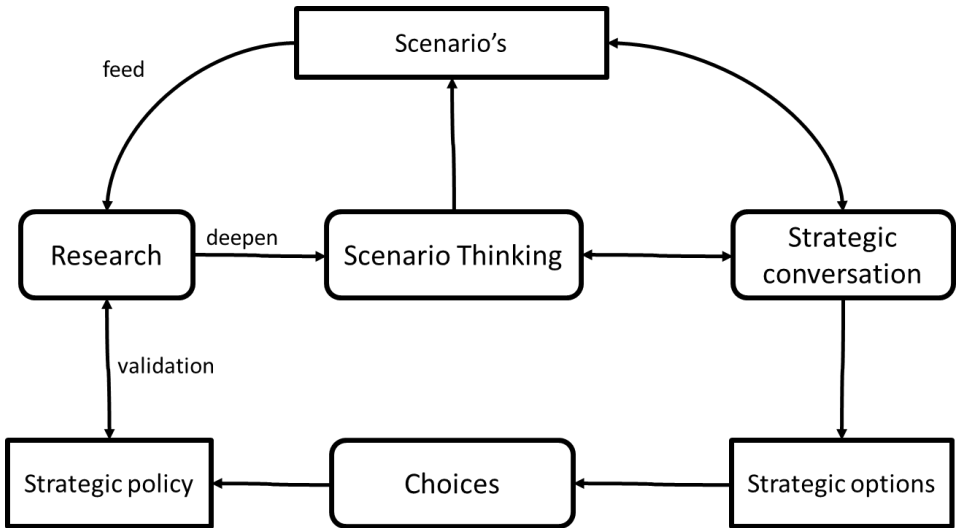
Scenario thinking or scenario analysis, is a strategic planning method used to make flexible long-term plans.

The scenario building process can be divided into phases:

- Approaching the question and the time horizon of the scenario project;
- Identifying and ranking of uncertainties and givens;
- Describing the fundamental future alternatives (for the two most important and uncertain influencing factors);
- Calibrating a 'future compass' out of the elaborated results;
- Plotting scenario narratives for each quadrant of the compass (basic dynamics, actors, conflicts, storylines and titles);
- Reflecting on the outcomes: implications and room for manoeuvre.

The key of scenario thinking is that you define one core subject or event and then use the method by creating a matrix on how this subject or event can impact your business.

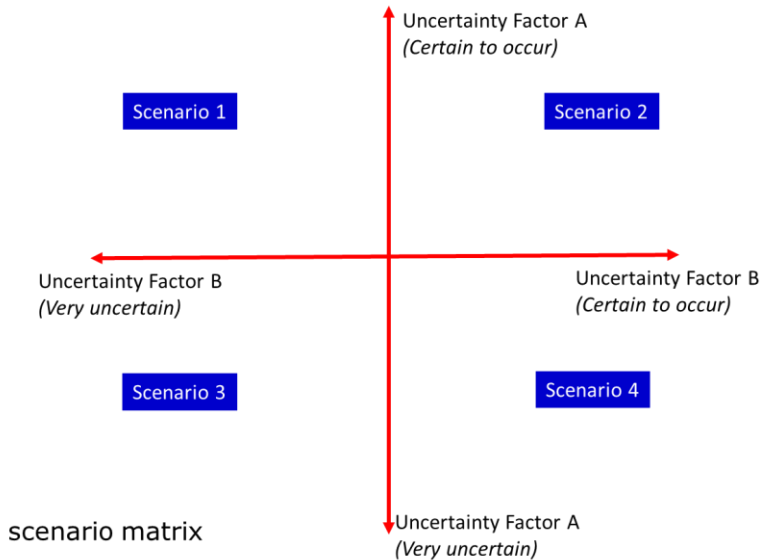
The key to make scenario thinking valuable is that you use some forecasting input, like this document and avoid too much speculation.



Approach for scenario thinking:

- Define Focal issue
- Question(s)
- Decision(s) and relevant timeframe
- Review past events and plot past events in the scenario matrix
- Identify driving forces
- Identify critical uncertainties
- Develop plausible scenarios
- Discuss implementation paths and update company strategy

Based on your chosen event you create a certainty matrix with typically has 2 axis:



To make scenario thinking fun to do you should name your axis and give your scenarios differentiating names.

And if done well you walk through every one of the four scenarios in detail to get more knowledge on how this can influence your business and what measurements are possible to cope with such a scenario. And of course it makes sense to embed scenario thinking in your strategy planning to perform it at least twice a year.

System Dynamics

System dynamics is a great scientific method developed already more than 50 years ago to solve complex problems. The method is based on creating models (rich pictures), causal loop diagrams and OSS tools like Insightmaker (see www.insightmaker.com) should be used to calculate effects on your business. This to really see the effect of possible solutions or measurements.

Systems dynamics offers a range of analytic tools to improve our capacity to think systemically, including ways to distinguish problem symptoms from root causes, reinforcing and balancing feedback, system archetypes, mental models, and system purpose and goals.

Business IT Innovation problems are typically problems that can be analysed in depth using System Dynamics. So if you are fighting with questions like:

- What would be the effect of a new product be on our current customers?
- What are the effects of more automation in terms of costs and profits?
- What are the effects on our employers on short and long term when applying certain new IT innovations?
- What measurements are needed to prevent business IT projects delivering real value?

You should try to use applying system dynamics to solve your complex business IT innovation challenges.

Appendix: Methodology used

We dislike research reports and prediction reports where the used methodology is not clear. Good research should be reproducible or at least give a solid view on how the research is done. So the process followed for this report is clear and simple:

1. Formulate research questions.
2. Find and select open access sources to get input on the questions.
3. Evaluate findings and if needed gather more input and/or find better sources.
4. Harvest sources and data used.

The research question for this report was clear but complex: What are emerging FOSS trends worth mentioning that can drive business IT innovations in 2017?

Out of this question multiple other research questions were deduced. The resources we used looking for answers are internet FOSS repositories, conference proceedings, mailing list archives and internet blogs and magazines available. And of course some innovative seminars and conferences were visited.

We talked to some valuable peers but in the end no matter how much text we elaborate on our methodology, this report is still opinionated. That is why this report is constructed using a creative commons license (cc-by). This encourage all readers to build upon this publication, extend it, or adjust it for your own company context.

Appendix: About the Author

Maikel Mardjan

Maikel is a business IT architect and loves to make designs for complex IT systems in a simple way. Maikel is always in for improving your security architecture and is not afraid to make his hands dirty when things get rough during implementation. Maikel has more than 20 years of relevant experience on various IT roles in famous (international) companies. Maikel loves to create good architectures and designs that really bring new success to companies.

Maikel holds both a Master (Msc) Business Studies of University of Groningen and a Master degree (Msc) Electrical Engineering, of Delft University of Technology. Maikel is TOGAF 9 Certified and CISSP (Certified Information Systems Security Professional) certified. Maikel holds has his own innovative IT company <https://nocomplexity.com>.

Despite privacy concerns, Maikel can be found on Twitter too: **<https://twitter.com/maikelmardjan>**

Dutch speaking readers are invited to visit:

<https://organisatieontwerp.nl>

This is my home for Maikels native Dutch speaking colleagues and friends!

Maikel is a member of the KNVI association, a Dutch association of information professionals.