Big Data in receivables management: New areas of application and analytical potential of big data

Thomas Meier, M.A. and Doc. Ing. Helena Makyšová, PhD.

Abstract: 'The biggest security gap is people.'[1]
     The hacker Benjamin says this almost philosophical sentence in the German thriller 'Who am I', which is about a group of hackers who, among other things, with the BND, Europol and the Russian cyber mafia, directly to the viewer to draw their attention to the weaknesses of each system. Since this sentence refers in the film to the Social engineering with which the social influencing is meant by people to receive thus access to their data. Of course it concerns a film very dramatically produced, indeed, Dmitri Alperovitch, security expert and co-founder of enterprise Crowdstrike is also sure that there is no sure system in this world, because at the end the biggest weak spot always the user explains. According to Alperovitch are over also the times in which only banks or armament groups have been a purpose of hacker's attacks, but meanwhile every branch can be hacked, it is because of his information or as a collateral damage of another attack. One should think that also in the demand management Cyber crime should play a big role, because in this area many sensitive data are collected by customers, indeed, a study shows that only 19 percent East European (also Germany) Undertake Cyber crime as a challenge consider.[2]This can be explained by the fact that in many accounts receivable departments the company tends to save and applies the topic of digitization and big data in other areas.[3]Receivables management is initially put at the bottom, which means that around half of all companies are concerned about not being able to keep up with the digital change.[4]Receivables management is an important part of the company, as the 2018 study by the Federal Association of German Debt Collection Enterprises (BDIU) shows that debt collection companies have returned 5.8 billion euros to German companies.[5]
     This sum clarifies the importance of receivables management and for this reason, this article on the topic of big data in receivables management should be examined in more detail and the opportunities and risks associated with big data.

Receivablesmanagement and itstasks

Before the definition of receivables management is presented, the following case game should first emphasize the importance of receivables management. For example, a company that achieves a return on sales of 5 percent per million euros would achieve an annual profit of 0.5 million euros with a total turnover of ten million euros. In this example, if the company had a one percent loss on average, that would amount to a sum of 100,000 euros. If receivables management were to be able to halve these losses, this would be equivalent to an increase in annual profit of ten percent, which would ultimately amount to an increase in sales of ten percent. In order to compensate for the resulting loss of receivables, the company would have to use 20 percent of its turnover.

The 2019 study by EOS, in which 3,400 companies were asked about their receivables management, shows how dramatic such claims defaults can be.[6]This study shows that payment defaults would mean a loss of profit for 43 percent of the companies, for 36 percent liquidity bottlenecks, for 33 percent higher interest costs and for 15 percent a threat to their existence.

According to BILENDO, a credit management platform, one of the most common payment options that companies offer their customers is a purchase on account (on target).[7]This payment method is particularly dominant in commercial trade and also because of the increasing online trade, the purchase on account with private customers is becoming more and more important, postulates the IT service provider Weclepp.[8]This creates a claim for the customer, i.e. an invoice that must be paid within a short time.

All claims and dealing with the different customers are summarized in the company as claims management. In the relevant specialist literature, receivables management is therefore also defined as 'systematic handling of company receivables'.[9]These include all tasks and activities, such as processing, securing and realizing claims. According to Huber, receivables management is a financial function that describes relationships with customers. 'Its job is to prevent late payments that tie up cash and cause [...] costs [that] can lead a company to the brink of insolvency.'[10]This can be applied to both private and public areas. In the private sector, however, the focus is on elements such as customer selection, the allocation of credit limits and monitoring the creditworthiness of customers, whereas in the public sector, accounting, reminders and debt collection are particularly important.

The receivables management begins with the agreement of payment terms with potential customers and is only completed when the receivable has been settled.In addition, receivables management has different functions. On the one hand, this area should provide values that show how claims are dealt with in the company and how they arise. In addition, an agreement must be reached with the sales and finance department on how high the maximum amount of claims per customer or per sales act may be, and action for the future must be planned. The receivables management also decides which measures are to be taken and organized, defines responsibilities and is also responsible for debt collection, dunning procedures and debt collection. As a last function, the receivables management has to control the payment behavior of the customer and the development of the debt collection. Big data could play a crucial role in this regard. The processing and structuring of the data allows conclusions to be drawn about future behavior patterns with regard to payment behavior and to predict them with a certain probability.

The receivables management has three main tasks, which are shown below.
On the one hand, the customer must be charged for the service or goods delivery after the service has been successfully performed. Accounts receivable management is also responsible for accounts receivable accounting. This means that all information related to each claim is posted. With the help of this data on the liquidity of the individual customers, measures can be developed to prevent late payments. As the last important task, receivables management is responsible for dunning activities and collection measures.[11]

Receivables management goals in connection with big data

The most elementary goal of receivables management is to ensure the company's liquidity, which forms the basis for its long-term success. In particular, bad debts should be prevented, which often leads to efforts being intensified or reduced in this area, depending on the problem. These fluctuations unsettle everyone involved, as it does not clearly show the importance of this part of the company for entrepreneurial success. In order to counter such uncertainty and to be successful in this area, receivables management should be aligned with the corporate strategy and clearly defined what contribution this corporate function must make to achieving the corporate goals. The goals must therefore be clearly, passively and actively formulated. A reduction in claims under 3% of sales or an increase in the realization rate to over 97% of sales in a certain period, e.g. one year, are examples of a clear target formulation.

The efficiency of receivables management also depends on how much this area is anchored in the company organization. Measures that support this can be found in the specialist literature. The first measure is the high location of this operational function in the organizational structure and integration into the finance management line. [9]Furthermore, all positions, both internally and externally, must be actively and effectively involved in the crucial processes. In this area, it is also essential that qualified receivables managers and the necessary ERP systems support the internal processes in receivables management and that corporate areas such as sales are integrated in an impact-oriented manner. In order to be able to plan and control receivables precisely, credit guidelines have to be clearly defined in order to build a foundation for this. In order to increase the efficiency of receivables management, it is also recommended to do so before closing the deal, especially in the case of large-volume orders, to check the creditworthiness of the business partner by inspecting the annual financial statements and the debtor and commercial register.[5]In Germany, it is advisable to use Creditreform to check the creditworthiness of companies, which, in contrast to "Schufa" focused on companies. If there are doubts about the liquidity of the customer, the transaction should only be concluded in advance. This data can then be stored in Accounts Receivable, for example to mark an upper limit for future customer orders.

Effective receivables management shows that the skilled workers have a good overview and control over all processes and do not linger on smaller, less important tasks. Liabilities and receivables can be monitored at any time, and market developments can be reacted to in good time, and risky accounts receivable groups can be identified early on. This makes receivables management not only more efficient, but also more transparent when dealing with customers, which in the best case leads to an improvement in cash flow. To do this, it is possible to uncover a customer's late payment and to inform it promptly. A major advantage of efficient receivables management is the minimization of bad debts and, above all, the early detection of risks, which means that no receivables tie up liquidity.

The best way to check the efficiency and cost-effectiveness of receivables management is to use business indicators such as the lead time for receivables, the turnover rate of receivables and the default rate of receivables. With the failure rate, for example, an assessment of your own company based on the industry comparison is the most sensible variant. The stock of all receivables as well as all outstanding and uncollectible receivables is also a meaningful key figure. However, there is a large amount of data that needs to be structured. This enables clusters to be generated, from which these important findings can be inferred.

The main disadvantage of inefficient receivables management is the reduction in operating cash flow, which arises from the late or non-settlement of invoices, as part of the turnover has to be written off for this.

This can and will lead to the fact that liquidity that is planned for short-term payment terms, such as from suppliers, cannot be made. It shows that poorly managed accounts receivable management can have a major impact on the creditworthiness and the company's own payment behavior, which in turn can affect the rating of credit agency operations. This would result in problems in obtaining external funding.

The potential of big data

One reason for the great potential of big data is the diversity in its application. In this way, big data can contribute to a wide variety of goals in a wide variety of industries. In retail, for example, where cost savings and increased sales are among the most common goals for use cases. Another example is banks or insurance companies that use big data to try to avoid compliance problems (mainly attempts to defraud).

Big data can also be used can be used for goals of employee recruitment, financial risk assessment, product improvement or also for market monitoring for better sales opportunities.

Frauenhofer IAIS derives three great opportunities from the technical innovation potential, the high relevance assessment from the survey of companies and the concrete innovation potential from the industry workshops.[12]

In the beginning, big data can make corporate management more efficient. This can be done through more precise forecasts of when something will be sold and reordered. In simple processes such as mail processing, learning systems can increase efficiency through automated processes. Another opportunity that arises from the use of big data is mass individualization. By learning the machines from relevant customer information while processing customer orders. This makes it possible to customize the service to individual people or objects in the future. In addition to individualized conversations, examples include predictive service for machines or usage-related insurance products. The third chance is intelligent products through big data. Many machines already have sensors that can provide information about the maintenance status. Self-learning thermostats or self-regulating houses already exist. But that is not the end of the development. In the future, more and more products and networked machines will be equipped with big data intelligence. The aim is for sensor data to be processed directly in order to react immediately to relevant information. In this way, machines and products should be able to better adapt to special requirements, optimize themselves with them and also prevent failures.

Big data also has an impact on controlling in that the supply of information and decision support are significantly influenced by the new potential. There is a new level of transparency due to the previously unavailable data on customers, products, resources and business processes, as well as new processing and analysis options. These new options influence several processes of the IGC controlling process (IGC = International Group of Controlling) from strategic planning to reporting and cost accounting to risk management. However, in order to fully exploit this potential, certain requirements must be met. The business management model must be aligned with big data. In addition, a company-specific data model must be created and the available data must be structured and checked for plausibility. For this reason, the following guiding principle has been included in the ICG controller mission statement: "Controllers develop and maintain the controlling systems. They ensure the quality of the data and provide decision-relevant information. '[13]

Controlling and bigdata

The second chance through the use of big data in controlling concerns the increasing automation of information preparation and information analysis. Due to the new technologies, controlling processes become significantly faster and more efficient. This is ensured by technologies such as in-memory processing or new analytics functions. Big data could help the controller create numbers with a time saving. Thus, the controller of the future will have more time to deal with the use of the resulting numbers.

Another study, which also deals with the potential simuisation of big data, comes from the book Big Data – Basics, Systems and Potentials of Use by Daniel Fasl and Andreas Meier.[14]

The study is based on a 2013 online survey of individuals and companies with a high level of business intelligence experience in the German-speaking world. Part of this study is, among other things, the analytical potential of big data. For this purpose, the support categories have been taken into account in better understanding of the influencing factors influencing the business environment as well as forecasting and forecasting and decision-making. The consistently high values in the categories of understanding and foreclosures and in the field of decision-making – simulation of decision models are particularly striking here. On the other hand, at the time of the survey, the generation of autonomous decision templates through machine learning and language processing played a minor role. The participants in this study also see the potential of big data more in the understanding category than in the forecast. In addition, it is shown that users rate the potential in the category prediction higher than the providers.

Respondents were also largely in agreement when interviewing the possible areas of application. The participants see the greatest potential for use, especially in the areas of corporate management, sales and marketing and with small reductions also in the area of research and development. This is also shown in the following graph, which shows that the participants of the study consider the potential for use in accounting and IT to be rather low..
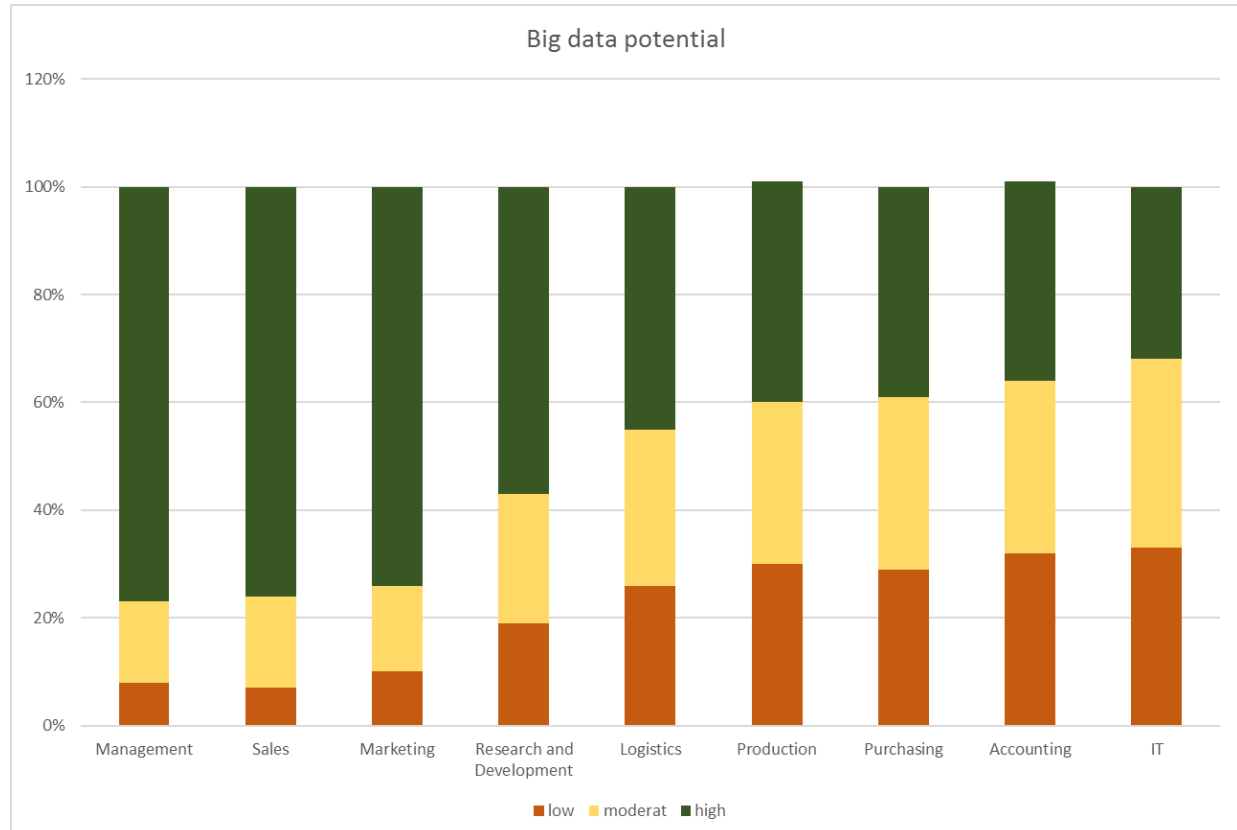

Figure 1: Potentials of big data according to Fasl, Meier 2016 (own presentation)

In the same order, the assessment of the application potential shown corresponds to the partial sample of the users. The only difference is that users from large companies see significantly higher potential, especially in the value-adding areas (purchasing, production, logistics and also research and development). To a lesser extent, this also applies to IT users. Here users from specialist departments see above all in purchasing in corporate management, as well as in production and logistics, higher application potential.

In the category of application potential in processes, the participants see the greatest potential in the process categories customer-side processes, innovation processes and production processes.[14]In this grouping, too, the respondents' assessment coincides with the partial sample of the users except for a few minimal deviations. However, there are clear differences between users from large companies and users from small and medium-sized companies. The users from the large companies sometimes see significantly greater potential in each individual process category. This applies in particular to the customer and supplier processes, but also to production and HR as well as IT, financial and innovation processes. There are also considerable differences in the assessment of potential within user companies. The employees in the specialist departments consistently rate the potential of big data analytics significantly higher than employees in the IT department. The greatest potential among employees in specialist departments is seen in supplier-side processes, followed by financial processes and HR processes. Then of production processes, IT processes and customer processes.

The participants were then asked about the potential of big data for business goals. The participants see a high degree of goal achievement, especially in the goal achievement categories of understanding business, improving decisions and increasing speed. Confidence in the correctness of the numbers only plays a small role for the respondents.
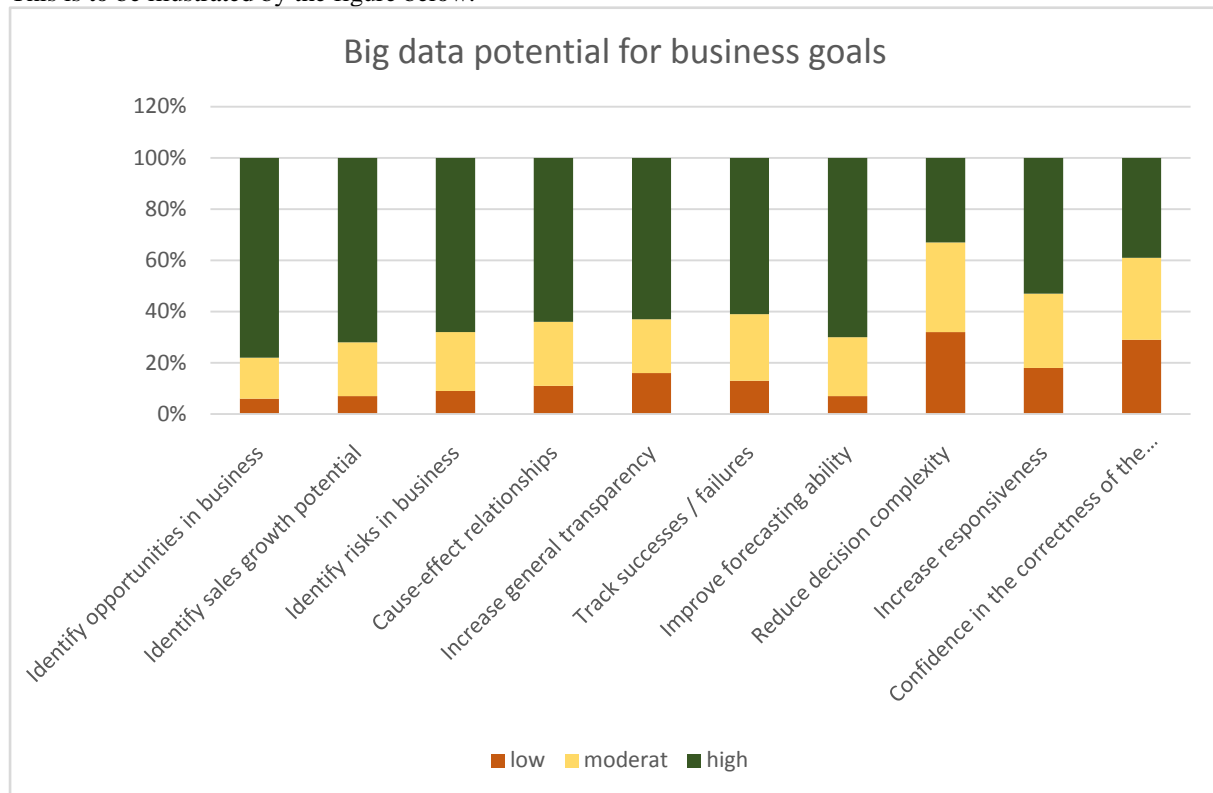
This is to be illustrated by the figure below.

Figure 2: Potential of big data for business goals, based on Fasl, Meier 2016 (own presentation)

Here, too, the assessment of users from large companies differs from that of SMEs. As with the application potential in processes, users from large companies consistently see higher target achievement potential.

In particular, they rate the target categories of increasing information as a product and speed significantly higher. Here, too, there are differences between the specialist users and the IT of application companies. Except for the target achievement category of information as a product, specialist users rate the potential ofbigdatahigherthan IT.

Big data opportunities in receivables management

Accounts receivable management staff face many obstacles. On the one hand, the requirements for this area of the company are extremely high and, in addition, they are increasing at an ever faster rate, and on the other hand, the necessary support from specialized software is usually lacking to be able to cope with these requirements. In particular, software programs that are AI-based and use big data offer receivables management the opportunity to improve workflows and use the entire amount of data effectively and efficiently, which in turn leads to better decision-making. [11]

Many companies control their processes in receivables management, for example with the help of spreadsheets, which are now outdated but less expensive. However, according to Philipp Nies, Senior Consultant - SAP Finance at Deloitte, it makes sense to view IT as a value-adding and not cost-intensive factor, especially in receivables management.[3]This is also shown by the EOS study, in which 38 percent state that the dunning system has only been partially digitized and in 18 percent of companies it has hardly been digitized.[6]In relation to the entire company, however, almost half of the companies surveyed stated that they had a high to very high degree of digitization. This shows that innovations such as big data analysis and artificial intelligence are more likely to be applied to other areas of the company. However, big data, especially in receivables management, offers opportunities that can give a company a competitive edge and even a competitive advantage.

Big data helps first of all to practice data hygiene, i.e. The quality of the data used is upgraded by being up-to-date, complete and avoiding errors and duplication of data. For example, duplication of data can result from the fact that a customer has several customer accounts in the system. This error can occur, among other things, through changes over time, i.e. there has been a change in the company name at the customer or there

has been a change of employee at the supplier and the customer is then created again in the ERP system due to these incidents because the existing master record could not be found. In the worst case, the delivery is then sent to both created accounts. With the support of big data and AI-based programs, such problems can be identified and eliminated at an early stage.

A great opportunity and advantage that automation techniques and the use of artificial intelligence bring with them is that communication with the customer takes place more directly and quickly. In order to be able to interact with the customer, for example, the installation of chatbots is one possibility.[15]With the help of these bots, requests can also be filtered in advance and processes are accelerated. Such self-learning models are also helpful for better collection, evaluation and use of the data from the collection processes. Through social network intelligence and the analysis of the collected data, each customer can learn their own preferences and habits using learnable algorithms. Thanks to this information, it can also be decided in advance via which channel (call, letter, email, etc.) the customer is best addressed. Each customer prefers a different form of contact. Some customers act much faster on short-term payment calls via WhatsApp, while others only react to a strict letter by post. This creates an advantage for both parties, because the customer has a contact person quickly and easily via his favorite communication channel and the creditor benefits from the fact that the dunning process is completed faster.

The AI can thus help the company to remain competitive and support the employees in that they can take on and handle more complex tasks, since the processing of routine cases is no longer necessary. Accounts receivable accounting can also offer an advantage with a software-based replacement for manual operation in that incoming invoices no longer have to be checked, booked and legally securely stored by hand. Automated programs can then read and process invoices and receipts and take over this time-consuming work.

In addition, bad debts can be avoided at an early stage using early warning systems. A previous analysis can show whether a customer has payment difficulties and why this is the case. In such a case, it is possible to contact the customer in advance and to find an agreement on the payment option that suits both sides. However, if a debtor still does not pay the claim on time despite previous analysis and consultation, big data can also help. With the help of customer-specific data and including historical data from other customers, a fair deadline for payment can be set via AI. Big data analyzes also offer the possibility of delivering valid results, on which a basis for data-based control of the processes can be established. In particular, in receivables management, unnecessary process costs can be avoided and the success rate can also be increased due to the real-time analysis of the data and the high level of agility.[15]

Another opportunity that big data offers in receivables management is that the data, regardless of whether it is structured or not and without transformation, can be transferred into software for scalable and distributed computing, which means that the very complex Extract-Transform-Load (ETL) Step is omitted. Big data tools also increase responsiveness and agility because data can be easily added and then used immediately. In the best case, big data offers the chance that, due to the large number of available data mining algorithms, questions can be answered that the company has never even asked itself or could never provide with data.

Dunning can also be automated using big data in receivables management in order to make the best use of the inventory data.171 All relevant data and information is already available in the databases of the ERP, BuHa or OPOS systems, which in turn are all used for accounts receivable accounting When a payment disruption occurs, the dunning process can be transferred to the responsible department in receivables management using parameters that have been defined beforehand.[16]The parameters can be, for example, the age of the claim or the dunning level. A major advantage of this automation is that it is no longer necessary to manually transfer the respective data records into the transfer format of the collection service provider. In addition, this reduces personnel costs and a commitment of resources becomes noticeable, since the employees who were previously responsible for the transfer of receivables can now be more involved in the core business. And there is a general professionalization of the dunning process and also becomes more transparent for the creditor, since all steps taken can be viewed as a feedback data feed.

Challenges and dangers

However, the use of big data in receivables management is also associated with risks. In this context, there are also certain challenges to be overcome in order to enable successful use.

In European countries in particular, there are always conflicts between the use of big data and the fundamental right to informational self-determination. It stipulates that people must / can determine 'who knows what about them when and on what occasion.'[17]This fundamental right already stands in principle against the collection of personal data. Furthermore, the European Charter of Fundamental Rights stipulates in Art. 8 Para. 2 that 'personal data must be processed in good faith for specified purposes and with the consent of the data subject or on another legally regulated legitimate basis.'[17]The law also requires that as little personal data as possible be processed in the interest of this digital fundamental right. Also on the basis of this basic right, the

data collected should be anonymized or pseudonymized. The principle of data economy or data avoidance is a response from those affected individually or those responsible for the system. This has occurred due to the increased sensitivity to fundamental rights across Europe over the past few years. The impression that they have been incapacitated or discriminated against against individuals or groups in the Big Data application makes it impossible to achieve acceptance of these applications. The example of O2, which had to postpone their plans to monetize the locations of their customers / users' mobile devices, shows how this can have an effect. Another example is the Hasso Platter Institute. Here one wanted to draw conclusions about the creditworthiness by evaluating social media. The impending loss of public image was too high and the project was abandoned.[17]

Another challenge related to data protection guidelines is ensuring anonymity and security. It should also be noted that denying functions does not create a feeling of suppression and monitoring when data is refused. This feeling can be caused by the exploitation of the ignorance of the user and the impossibility to reject the use of data. The mentioned feeling of suppression and surveillance can arise from the resulting normalization of data usage.[18]

Data security and the financial industry

Another challenge is ensuring data security, especially in the financial industry. Because here the effects if someone else should get account data can be serious. "It is all the more worrying that there is unfortunately no one hundred percent data security. It is an illusion. Anyone who promises this to customers is simply making false promises."[19]The challenge, especially for financial service providers, is to constantly optimize their systems in order to be able to protect themselves against attacks in the best possible way. This is to prevent strangers from accessing sensitive information. The advancing digitalization means a vicious cycle for companies. In short, the vicious cycle consists of further development and increasing risk. Because everyone wants to develop further and digitization is necessary for this. However, digitization also facilitates data access, which is why the security requirements increase significantly. Cyber security is the biggest challenge in the financial industry today - especially due to the development of digitization and big data. However, it must also be mentioned that big data also plays a role in data security to ensure this. With the help of big data, anomalies and unauthorized access should be detected at any time.

The unmanageability of the data also poses a challenge in big data. Due to the enormous amount of data, it is almost impossible to achieve the perfect result, despite the algorithm. In this way, unimportant data, which should not be part of the analysis, can have a significant impact on the result. By including such data, a correct pattern can result in a wrong one. However, patterns can also arise where there are actually none at all. On the basis of these wrong patterns, wrong connections are made, which can then lead to wrong insights and subsequently to wrong decisions or conclusions.

Another challenge in big data is real-time data. It is often much more important for the optimal offer in which situation the customer is currently than, for example, the buying behavior of several years ago. Therefore, the importance of real-time data will continue to increase.

Technical innovations and areas of application

Some companies have already recognized the potential and opportunities of big data in receivables management and have developed suitable programs for this. An example of this is Deloitte. The service company in the areas of auditing, risk, tax and financial advice uses intelligent receivables management that is efficient and effective using machine learning.[20]With Reimagine Collections and Disputes, Deloitte uses software based on SAP Leonardo, a solution that uses machine learning for receivables management. SAP Leonardo is a system for digital innovations that, for example, provides applications and microservices for machine learning, the Internet of Things or big data analysis. [3]The software automates processes that employees had to enter manually beforehand, and machine learning also has the advantage that solutions can be found if a customer does not pay the bill because they are against the price or quality of the delivered product Product complains. Michael Portermann, Director of Deloitte AG, explains that there is a very high probability that problems will arise again with the next delivery for a customer who has already attracted more clarification cases in advance. In such cases, the software evaluates the data from past customer transactions and the resolved cases, and is therefore able to predict the likelihood of a complaint with certain invoices.

Reimagine Collections and Disputes also provides the employee with all information about the dispute case and starts automatic processes that help to clarify the contentious issue. Furthermore, the software from Deloitte is also capable of process analyzes, with which the determination of the number and processing time of the clarification cases is accelerated. It also makes it easier to understand the reasons why payments failed to appear and how high the claims were. The system can also answer questions such as how long it takes for a case to be closed, thus providing key figures that stimulate food for thought for the improvement of processes.

Innovative pioneers - collectAi

The Hamburg-based company collectAi, a "start-up" launched by the Otto Group in 2016, developed intelligent or digital AI-based receivables management.[21]CollectAi has recognized the ineffectiveness and inefficiency of receivables management due to the large manual implementation and optimized it with AI and big data. For the Hamburg-based company, the focus is particularly on the customer and is therefore addressed individually and via his favorite communication channel.

CollectAI developed an individual dunning strategy together with the respective company. CollectAi's software mainly sends payment reminders to customers using an AI to remind them of the claims to be paid. This technology enables customers to pay quickly and easily. Every customer who has an open invoice is reminded of his payment via his preferred communication channel and at the right time, which was previously determined by the AI. For this purpose, the company uses the information in the database, which contains convenient sending times for payment reminders, correct tonality and communication channels with fast response times. For this reason, the system learns every time it interacts with the customer and quickly finds out how best to address a customer. As an example, the system recognizes when a debtor repeatedly does not open their emails and saves this as a negative event in the system and decides to try another channel for this customer. For this reason, CollectAi has also expanded the communication channels to include SMS, WhatsApp or Skype in order to be able to guarantee direct communication with customers who are not considered debtors and who are to be motivated to pay their bills. If the suitable channel has been found on the basis of the information, such so-called payment links, which are integrated into the payment reminders, are sent, and thus the customer comes to the intended payment page and can use the payment method of his choice, for example credit card, PayPal or Direct debit, pay the bill. With this method, the debtor no longer has to dial into his bank account and write off the necessary payment data, but all this is taken from him in advance, which leads to an increase in the realization rate and an increase in the company's liquidity. Should there be any questions from the customer, the customer can simply react to the payment reminder and will then be forwarded to the company's customer service, which ensures constant availability for the customer. This individual communication improves the relationship with the customer and increases the chance that reminded customers will remain loyal to the company. With this AI-based dunning procedure, the company collectAi has developed a way for companies to minimize bad debts without much additional effort. So far, the company has mainly specialized in the banking, e-commerce, energy supply, insurance and fintech sectors. However, if companies understand more and more how important receivables management is for the company, collectAi's technology could also become interesting for companies from other industries.

Resume

In conclusion, it should be noted that it is important for companies to recognize that receivables management can only act intelligently and efficiently if it receives the necessary digital support. This area of the company contains a lot of data about the different customers, which are just waiting to be evaluated correctly. Big data can be a meaningful and important pillar and help to advance the company. The technical support also makes it possible for receivables management not only to react, but even to be proactive. The company no longer has to wait until payment has been received in order to clarify this case in the event of a payment default with complaints, dunning procedures and the like, but can request the data in advance based on the evaluated data and address the customer via the appropriate channel . As a result, no capital is tied up and it is ensured that your own company remains liquid and the employees in receivables management can take care of the core business and do not have to stop complaints or reminders that could have been prevented in advance. Companies like Deloitte or collectAi have already recognized this potential of big data in receivables management. They represent exemplary examples for companies in which the advantages of big data are given priority in this area.

ColletcAi should be of particular interest to online retailers, as it is especially in this special area that individual and personal communication with the customer is crucial in order to win regular customers. Despite all the risks, such software programs are the great opportunity to be one step ahead of the competition. The potential of big data shown also shows that all possible applications have not yet been exhausted and that the digital future therefore has a lot of scope in this area. However, employees need to be trained in cyber crime so that one day a hacker like Benjamin does not view the receivables manager as a weak point.

Sources

[1]. ZEIT ONLINE | Lesen Sie zeit.de mit Werbung oder imPUR-Abo. Sie haben die Wahl 2020.000Z. https://www.zeit.de/zustimmung?url=https%3A%2F%2Fwww.zeit.de%2Fkultur%2Ffilm%2F2014-09%2Fwho-am-i-film%2Fkomplettansicht. Zugriff am 29.06.2020.

[2]. Der Bank Blog: Trends und Strategien für die Finanzwirtschaft 2020.000Z. https://www.der-bank-blog.de/. Zugriff am 29.06.2020.

[3]. SAP Software Solutions | Business Applications and Technology 2020.000Z. https://www.sap.com/index.html. Zugriff am 29.06.2020.

[4]. ▷ Die Plattform für Pressemitteilungen und Pressemeldungen | Presseportal 2020.000Z. https://www.presseportal.de/. Zugriff am 29.06.2020.

[5]. Startseite | BDIU Bundesverband Deutscher Inkasso-Unternehmen e.V 2020.000Z. https://www.inkasso.de/. Zugriff am 29.06.2020.

[6]. EOS Solutions – EOS Group: For A Debt-Free World. We manage your receivables 2020.000Z. https://eos-solutions.com/. Zugriff am 29.06.2020.

[7]. Bilendo Credit Management | modern und zukunftsweisend 2020.000Z. https://www.bilendo.de/. Zugriff am 29.06.2020.

[8]. Cloud ERP, Warenwirtschaft & CRM - 3 Mal in Folge System des Jahres 2020+00:00. https://www.weclapp.com/de/. Zugriff am 29.06.2020.

[9]. Behnke-Hahne, B.: Forderungsmanagement in der öffentlichen Verwaltung. Prozesse, Optimierung, Trends 2016.

[10]. Huber, A.: Forderungsmanagement. Zahlungsausfälle vermeiden - Außenstände eintreiben 2005.

[11]. Müller, R.: Erfolgreiches Forderungsmanagement. Strategie - Risikomanagement - Liquiditätsmanagement. Springer Gabler, Wiesbaden, Germany 2018.

[12]. Fachartikel - Big Data und künstliche Intelligenz: „Maschinen dürfen auch bei … 2020.000Z. https://www.bafin.de/SharedDocs/Veroeffentlichungen/DE/Fachartikel/2018/fa_bj_1806_BDAI_Interview.html;jsessionid=1C0F063FB516C2ADB182DA4A0C2CBE42.2_cid298. Zugriff am 01.07.2020.

[13]. Featured: CC Controlling 2020.000Z. http://www.cc-controlling.at/. Zugriff am 01.07.2020.

[14]. Fasel, D; Meier, A. (Hrsg.): Big Data. Grundlagen, Systeme und Nutzungspotenziale: Edition HMD. Springer Fachmedien Wiesbaden, Wiesbaden 2016.

[15]. contentmanager Magazin - Digital Marketing & eCommerce. Seit 1999 2020.000Z. https://www.contentmanager.de/. Zugriff am 01.07.2020.

[16]. IT-ZOOM – World of Technology 2020.000Z. https://www.it-zoom.de/. Zugriff am 01.07.2020.

[17]. ULD 2020.000Z. https://www.datenschutzzentrum.de/. Zugriff am 01.07.2020.

[18]. Industry-Analytics.de - Datenanalyse für den Mittelstand - Startseite 2020.000Z. http://www.industry-analytics.de/. Zugriff am 01.07.2020.

[19]. Finanzmagazin, I.: IT Finanzmagazin · Das Fachmagazin für IT und Organisation bei Banken, Sparkassen und Versicherungen 2020.000Z. https://www.it-finanzmagazin.de/. Zugriff am 01.07.2020.

[20]. Deloitte Deutschland 2020.000Z. https://www2.deloitte.com/de/de.html. Zugriff am 01.07.2020.

[21]. collectAI | Intelligent Payment Solution Provider | Teil der Otto Group 2020.000Z. https://www.collect.ai/. Zugriff am 01.07.2020.