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#### **INVITED PAPER**



### Towards AI application marketplaces - an interview with Dorian Selz

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### Abstract

This interview with the CEO from Squirro reports on how a search engine in the enterprise context evolves with artificial intelligence (AI) towards a cognitive search engine and ultimately towards an electronic marketplace for information objects. Using several examples, Dorian Selz describes the opportunities of Squirro's low-code in creating user-specific information objects from internal and external data sources as well as in deriving probabilities and projections. This not only has the potential to improve existing business processes, but also sheds light on new predictive capabilities. The example shows potential elements of future AI marketplaces, such as models, app directories and connectors.

Keywords Artificial intelligence · cognitive search · AI marketplace · information objects







### Interview on July 02, 2021

### **Personal details**

Dorian Selz is co-founder and CEO of Squirro, a data science company headquartered in Zurich, Switzerland, with offices in Germany, Singapore, UK and the US. He studied economics at the University of Geneva, Switzerland, and in 1995 he joined the Institute of Information Management at the University of St.Gallen in Switzerland. During this

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time, Dorian was Electronic Markets' executive editor and contributed strongly in positioning the journal as an international academic journal. After completing his PhD thesis on value webs in 1999 at the University of St.Gallen he joined the e-business consultancy Namics where he became COO and from there he founded local.ch, which has become the largest local search service in Switzerland. The pictures show him on the left followed by the interviewers Rainer Alt and Hans-Dieter Zimmermann.

### **Background details**

Squirro was founded in 2012 and grew at a rate of 80% annually (CAGR) to employ a staff of 45 people today. The company is partially financed by investors like Salesforce, which saw Squirro as one of their three artificial intelligence (AI) investments in 2017. Among the core products is an insights engine that applies AI for decision support by deriving contextualized insights from various data sources

and by displaying this information via diverse front-end applications. In 2021, Squirro was added by the market research firm Gartner to their "2021 Magic Quadrant for Insight Engines" and assessed as being visionary with a highly complete vision (Emmott & Mullen, 2021). At the heart of the solution is an augmented intelligence model that aims at combining humans and machines following a real-time closed loop approach (Selz, 2020). It extracts data via connectors (e.g. from Global Data, Google Ads, Hubspot, Marketo or Salesforce Pardot) in real-time and makes it available for decision tools and dashboards. When analyzing the data, these user interactions are fed back to the (big) data foundation, which enables that learning processes are triggered from the results.

One of the recent innovative products follows along the lines of a prior Electronic Markets editorial, which discussed the relationship between digital platforms and AI (Alt, 2021). Besides conceiving digital platforms as data sources for AI and AI as valuable applications for digital platforms, a third relationship captured the formation of dedicated digital platforms for AI. An example is Squirro's Marketplace, which the company conceives as the first application marketplace for AI and machine learning (ML) worldwide. The platform supports users in creating their own AI solution with a no- or low-code approach and in downloading preconfigured apps from the app directory (see Fig. 1). It already contains apps on cognitive search in various domains, for example, aviation news, financial markets, food safety and pharma news. Further connectors, models, dashboard templates and more augmented intelligence solutions have been announced to be included in the future.

#### What was the main idea for Squirro's solution?

In the first place, Squirro enhances what we previously built at local.ch. Here we essentially digitized the yellow pages and learned what probabilistic information retrieval means. In the last eight years, we have combined this search with machine learning and now apply it to unstructured data sets, which have little or no structure in the sense of computable structure. We believe that in the area of professional data in the enterprise, we currently have the watershed moment that the music industry had about 20 years ago. At that time, the existing business model of the music industry was block selling music on a CD. This was replaced by a new model based on MP3 technology, where instead of buying CDs you now subscribe to a streaming service and a playlist. We are convinced that this is currently happening with data as well, especially in a corporate context. Contrary to most of our competitors, we draw insights from as many data sources as possible. In fact, each company and in particular larger ones have stored large amounts of data in dozens of silos, such as documents, transaction databases, customer profiles and the like. While machines excel with structured data, humans still have advantages in understanding much of the unstructured data. If we succeed in continuously extracting insights from this wealth of data, we will have achieved



Fig. 1 Architecture of the Squirro Marketplace

the same thing as in the example from the music industry mentioned above. Analogous to a playlist of a music streaming offer, users may subscribe to the information that is relevant for their work.

### To what extent do you aim to automate decision making?

Realistically, we aim to support human decision makers instead of replacing them. Even the best managed companies with a sophisticated enterprise resource planning (ERP) system, will be far from having all company-relevant data available in digital form. You need to recall that customer relationships are more than what is stored in the ERP or the customer relationship management (CRM) system. Even in the best-managed CRM solutions in the world, contacts, emotions or conversations never find their way into the system. You may compare it with a pilot who would be illadvised to calculate the range of the airplane only from the fuel level of the left tank. In the enterprise context, it would be equally foolish to manage customer relationships only on existing data. Today, we know of use cases for many repetitive tasks where sufficient data is available to allow automation. With the same number of employees, businesses will be able to be much more effective, because the machine can take over and support humans in deciding faster. In particular, when it comes to shades of gray, this promises superior results. Squirro comes in here with its cognitive search and aims to combine data from different sources for existing business applications such as a CRM system. Following our approach of "Gather - Understand - Act", these application systems are no longer just systems of record, but they become systems of insight. I am convinced that these will add an additional software layer to many enterprise architectures.

### Can you give us some examples?

Candriam is a medium-sized asset manager in Paris that invests in pension fund assets. The first step is to analyze the individual investment strategies or mandates in order to understand the demand in the market. In a second step we compare all the information with Candriam's own funds and, in a third step with competitor funds. Based on these three pieces of information, we calculate which Candriam funds match the market demand better than those of the competitors. This delta is understood as a lead and allows account managers at Candriam to determine which three pension funds to call in order to place Candriam's own funds. The informational delta translates directly into cash for the company. Candriam generated one billion in additional opportunity volume and effectively closed tens of millions in additional fund volume within nine months of last year 2020. While this applies to front-of-the-house processes, we also see substantial improvements in the back office. Standard Chartered Bank has around 40 million inbound cases in its commercial business. These tickets are problem cases in business transactions and we know the ticket, the customer relationship, as well as the internal organizational steps of the support organization. Based on this, we classify the ticket and can assign it to the right person, often already with a concrete solution proposal based on all available data. This usually cuts the so-called "meantime to resolution", a key metric in this context, by about a third. It entails direct cost savings for the company, assuming that each ticket costs a few hundred dollars.

# What is the role of external data sources in your solution?

Although internal data are often the natural primary sources, due to the variety of connectors our solution works like Lego with internal as well as with external databases. This enables customer-specific outcomes and the combination of internal and external data in a data fabric distinguishes us from the competition and is certainly one of our core strengths. At present, there are only very few companies that are able to combine data from very different sources into a unified network. However, approaches directed at establishing crossorganizational data spaces like Gaia-X are clearly pointing in this direction. While such activities exist in certain parts of the market, for example in manufacturing and industrial settings, we have so far not seen them in "front-of-thehouse" areas like CRM. In addition, each AI system needs domain-specific knowledge, otherwise all the nice logic is useless. To address this, we have established our own knowledge in the area of financial services and insurance and our partners contribute their own domain knowledge. For example, we have a French partner who is good in the domain of fast moving consumer goods and who also wants to build his own models. Finally, the no- or low-code nature of our infrastructures allows users to build complex machines without being trained as data scientists. Companies will have to invest in the parameterization of these models. This can be seen as analogous to Spotify, which develops algorithms for creating playlists, but also has music editors that curate playlists.

# This user-specific curation of data could be considered your core competence?

This is correct and you may see this in the case of Standard Chartered where the bank provided us with hundreds of PDF documents, which we analyzed by machine and classified the content in various dimensions. We created topical clusters on this basis and employees may now compile their individualized research newspaper, which contains relevant data on a daily basis. Likewise, based on the active news consumption in the context of the employee's task profile, the profile is also passively optimized on an ongoing basis. In addition, there are recommendations in analogy to Amazon's: "because you read this, we recommend the following". What makes us different from other solutions is that we can feed "hard" market data in a contextualized manner. For example, data from Refinitiv, Moodys or Standard and Poor, is integrated into the CRM tool. It is a big challenge to match and synchronize external and internal data due to data heterogeneity. The use of different naming systems implies that ABB might not mean the same to every user and cause that ABB is not ABB. Furthermore, social media data tends to be one-dimensional, while professional market data tends to have hundreds of data dimensions. We address this challenge by building ad-hoc taxonomies in the background. Linking this data meaningfully with an account in the CRM system is something that these systems have largely not been capable of, with few exceptions, including IHS Markit and partially the solutions from IBM, Google, Microsoft and of our partner Salesforce.

#### Are customers working with your solution as well?

At present, we are not directly supporting customer interactions. However, many activities are directly relevant to customers. For example, at Standard Chartered, we classify erroneous transactions, so called mistrades, from US dollars to Singapore dollars. If, for example, the cutoff date was missed, the reconciliation has to be done manually since the rate might have changed slightly. The system cannot do this automatically. Standard Chartered has several thousand cases of this type per day. If the model knows that a mistrade occurs when the cutoff date was missed, you can build that, and assuming that all big banks have more or less the same problem, you can now map this model without personal identifiable information, i.e. detached personal data from the information object. Our vision is that these information objects will become tradeable and it would also be conceivable to transfer this approach to medical records and many other fields of application. We are currently in contact with American companies for the startup market, a domain where diverse information asymmetries exist. For example, venture capitalists have a broad overview, while start-up businesses are typically only aware of their own situation. Knowing that there are numerous start-up databases like Crunchbase and others in the US, we can imagine tracking all these information objects that require funding with their different dimensions and evaluate a start-up. Similarly, on the investor side, marketplaces might enable automatic matching and significantly reduce information asymmetries.

#### What are your plans in becoming a marketplace?

In fact, creating an electronic marketplace has been a priority over the past months. In a nutshell, the Squirro Marketplace provides an easy way to consume specific data sources, to set up individual data sources with preconfigured data connectors, and to get preset data enrichment steps or machine learning trained classifier models as well as full application templates and even fully AI-enabled AI Apps. We have been working on three points. First, we emphasize self service. This means that users can approach us via start.squirro.com, which is an embryonic marketplace where we provide applications to companies and where companies may also install applications. Second, the AI Studio allows to build simple models. This is important, since machine learning would hardly work without data labeling and many companies have too little data science knowledge. Third, learn.squirro.com is our online learning platform where interested parties may learn how the respective services work both technically and from the business side. We will expand this embryonic marketplace and interested parties can then obtain connectors to various databases, apps and also models from the marketplace. We have the vision that a company can assemble its own insights application accordingly and to empower business analysts to build applications with minimal training within one or two days. A typical application scenario would be to integrate existing customer data from a Sharepoint application into a new CRM system like Salesforce.

## Could these information objects also develop towards digital twins?

Funnily enough, I was sitting with a company from Zurich this morning, which is building digital twins of production machines, in particular, for wind turbines. Although this is not something we do, we have contributed in extracting data from distributed production processes, for example, emergency downs, and we have established a digital twin of a production process. If we do this continuously and link the data in a meaningful way, we may be able to calculate probabilities to determine when emergency downs occur at an early stage, say within five to ten minutes, and then call for action in order to prevent it. This is fundamentally different from most industrial plants, which are still running with a rather hard set of rules. However, such ideas are still premature in most firms and their current emphasis is more on the topic of predictive maintenance, which only comes at the very end of a production cycle, and many insights might be collected to improve upstream activities. Combined with the marketplace approach, it would be conceivable that the informational tokens containing the information about critical situations are traded. If you transfer this model to other,

non-production processes where you know the solution to the problem, this opens a large window of opportunities.

### Since you consider tokenizing information objects, how is your view on blockchain technology?

We have looked at the blockchain technology for our marketplace. Once objects are tradable, you can think of smart contracts that make them auditable, traceable, and verifiable without giving both transaction partners access to their systems. In the case of Standard Chartered, the bank has a model for USD Singapore dollar corrections that it intends to sell to HSBC. Naturally, HSBC will not be interested in having Standard Chartered look into their systems, but Standard Chartered may still want to be compensated on the basis of the number of documents processed. We see potential for blockchain technology in enabling trust in such distributed settings and in creating a kind of tokenization based on the smart contract idea. However, the developments are still at an early stage and I am not satisfied by the efficiency of writing data in a distributed database infrastructure. There might be potential if we use the infrastructure not for transactions, but mainly for creating trust, since these verification purposes involve less time constraints.

### How will the trading of information objects change your business model?

Let me explain why I am convinced that the vision of tradable objects will come. At Standard Chartered we are steamrolling the meantime to resolution process by  $\pm 30\%$ . This is a game changer. Until now, the main focus has been on optimizing support processes and the corresponding metrics, which is currently also reflected in the price negotiations. However, we should think ahead and ask whether we can speed up the process by 50% instead of 30%, and also include the impact of reduced mistrades on sales. It would be conceivable, for example, to design a new customer experience, since the customer service representative is involved in the rectification of the mistrade and could therefore communicate with his customer accordingly. Another idea is that massively shortened processes allow a different pricing, because the cost basis is changed by the process shortening and less working capital being needed. In other words, our biggest enemy today is the status quo. It is roughly comparable to the situation in online retailing in the mid-1990s, where innovative and visionary ideas were greeted with disbelief. What counts for operational management is cost reduction, but not new options for innovative business models, different market positioning or new service offerings.

### Can you share some of your future plans for Squirro?

At present, Squirro is still a small company with a big potential. Contrary to the large players like Google or IBM, we face resource limitations, but we have a clear vision and many opportunities. This includes the marketplace, which we expect to evolve once more companies are deriving more benefit from their AI investments than today. We expect AI to actually take off with a latency, similar to what we observed with e-commerce: while the technology was available ten years before, the adoption only occurred on a broader scale around 2008. Since AI has been around for many years already, I expect a comparable diffusion in one or two years and we plan to use this impetus to grow by ourselves instead of being acquired by some large player. Imagine if our information objects would include more functional logic and autonomy. You could have relationship managers that offer you a service for recurring activities, such as currency transactions, that would also proactively make suggestions to avoid the likelihood of a mistrade and the like. It will be exciting to see such solutions, which - and we should always be reminded – should be in the interest of the humans using these systems.

Dear Dorian, thank you for the interview.

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