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## **Design Thinking and Storytelling in eGovernment: The Case of ThinkData.ch**

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### **Abstract**

ThinkData is an interactive service for raising awareness on data protection and transparency in the organisational context. Originating from a study carried out by an interdisciplinary work group as part of a think tank on services science and innovation (ThinkServices). ThinkData allows its users to become familiar with the concepts of data protection and transparency through short stories, situations involving employees, managers, HR managers and information systems professionals. In this paper we present the design thinking approach used to develop ThinkData.ch and we describe the main features of the service. In the analytical part of the paper we discuss the main challenges and issues brought about by the tentative generalization of our approach, particularly in terms of modelling the multi-jurisdictional aspects of data protection and transparency.

### **Keywords**

Design thinking ; data protection ; transparency ; storytelling ; reuse ; multi-jurisdiction.

### **1. Introduction**

Many political processes involve solving wicked problems, such as environmental or socio-economic issues. This paper deals with such problems, where for example public and semi-public organizations have to find a balance between data protection and transparency legal requirements. Oftentimes these legal requirements are very difficult to understand for people who are not legal experts but still have to implement services required to be compliant with legal frameworks, e.g. human resources managers handling employee data or IT specialists dealing with employee emails or mobile devices. We argue, based on a concrete case, that design thinking, co-creation and innovation games can be valid and valuable approaches to address such wicked problems. However, we have found that the use of such techniques is not very frequent (or at least not much documented in the literature).

In this paper we therefore investigate how design thinking and innovation games approaches can be used, based on the concrete case of Thinkdata.ch. Moreover, in this specific case we report on, we also show the value of using storytelling in raising awareness on complex problems. In the first part of the paper we present the design thinking approach that led to the development of ThinkData.ch and we discuss the main features of the service. In the analytical part of the paper we provide an assessment of ThinkData by applying a framework derived from previous work of the authors and initially inspired by the Technology Acceptance Model (TAM) of Davis. Finally we discuss the main challenges and issues brought about by the tentative generalization of our approach, particularly in terms of modeling the multi-jurisdictional aspects of data protection and transparency. We conclude

by discussing the hypothesis of the value of Design Thinking and Storytelling as key factors for designing global people-centric awareness services on complex legal and public policy frameworks.

## 2. Design Thinking and Gaming Approaches

Governments generally support participation in order to improve the efficiency, acceptance, and legitimacy of political processes (Sanford and Rose 2007). As any political process deals with solving *wicked problems*, governments have to find innovative ways of encouraging participation. Indeed wicked problems are “those that defy conventional approaches to understanding, planning, design, implementation and execution because: (i) The stakeholder interests are so diverse and divisive; (ii) Interdependencies are so complex and so little understood; (iii) Behaviors are so dynamic and chaotic (unpredictable)” (Newman and Gall 2010). *Hybrid thinking* is one approach proposed by Newman and Gall (2010) to address such issues: it is based amongst others on *design thinking* and *co-creation*. One such example is VoiceS research project (Holzner et al. 2009) that uses *serious games* to foster eParticipation and make “complex EU co-decision procedure accessible to a large audience (especially among younger citizens), thus providing necessary understanding and enabling them to contribute actively to the platform”. Holzner et al. (2009) define gaming “as a structured or semi-structured activity, usually undertaken for enjoyment and sometimes also used as an educational tool. Key components of games are goals, rules, challenge, and interactivity.” Furthermore *serious game* “came into wide use with the emergence of the Serious Games Initiative in 2002” which is “focused on uses for games in exploring management and leadership challenges facing the public sector” (Susi et al. 2007). Furthermore, gaming techniques have been used very successfully for decades in innovation and market research. Early adopters of such techniques were Silicon Valley companies who needed to find alternative ways to create new products. A notable example of this is the Innovation Games initiative of Luke Hohmann (Hohmann 2006) now turned into an online collaborative service<sup>1</sup>.

## 3. Research Methodology

ThinkServices is a think tank on Services Science and Innovation that was created in 2008 by the Institute of Services Science of the University of Geneva and the Technology Foresight Office of the Canton of Geneva in Switzerland. The ThinkGroup Data, Society and Transparency (TG-DST) was initiated in 2010 by ThinkServices and the Geneva data protection and transparency commissioners. This group brought together around 20 data protection and transparency experts as well as professionals and academics from various disciplines (law, management, information systems, graphic design, and human resources).

The main research objective of TG-DST was to raise awareness on data protection and transparency issues in the organizational field, i.e. to address one of those wicked problems mentioned in the introduction by making the relevant laws and regulation understandable and usable for an audience of professionals who are not legal experts.

In order to reach that research objective we set up monthly half-day meetings that were held throughout 2011 with the goal of developing a self-assessment toolkit on data protection and transparency. A deadline for launching the service was set for January 28th 2012 on the occasion of the Data Protection Day. The focus on organizations quickly appeared based on the lack of understanding of these issues among the various stakeholders (HR specialists, top management, IT

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<sup>1</sup> Innovation Games, online service, <http://innovationgames.com/> (retrieved Jan 2013)

management, employee, etc.). Moreover, the service had to be based on realistic data protection and transparency issues, and to provide recommendations, legal references and links to concrete examples. Four subgroups focused on stakeholder profiles defining scenarios on the basis of a generic storytelling canvas similar to the ones used in fairy tales such as the Little Red Riding Hood. The stories were then reworked in order to ensure coherence and were validated by data protection and transparency commissioners both at federal and cantonal levels. The first implementation of the service was done by a web design agency and was launched in French as planned on the Data Protection Day (January 28, 2012). Currently Thinkdata.ch is also available in German, Italian and English.

#### **4. Description of the solution**

Our main objective was to bridge the understanding and awareness gap found between the increasing complexity of legal frameworks and their target audiences. The area of data protection and transparency is a good example of this situation, as these laws impact employees, managers and citizens from both organizational and personal standpoints. Moreover, these requirements are increasingly difficult to meet, with the digitization of our society, cloud computing and the growing use of personal devices in organizations (BYOD, Bring Your Own Device). Indeed connected smartphones along with their many apps, their GPS, etc., raises new issues which were unheard of ten years ago. The EU Data Protection reform (Hustinx 2013, De Terwangne 2013) is currently underway (see European Data Protection Reform) to adapt the 1995 rules in order to offer more control on personal data, with notions such as “explicit consent” or the “right to be forgotten” (European Commission 2012).

We believe that an appropriate way to bridge these gaps between the complexity of legal requirements and the understanding of the target audience is education and training. Indeed we wish to raise awareness on these issues in a way that is both engaging and useful. In order to achieve this we chose a design thinking approach. Indeed some members of the ThinkServices think tank had a technology and innovation background and since the objective was to design a service (artifact), Design Science appeared to be a suitable methodology. These techniques have been used by ThinkServices since the beginning (Glassey & al. 2011). Globally our approach is adapted from techniques originating from *design thinking*: for an introduction see Brown and Wyatt (2010) or Brown (2008); for more on design science we recommend Vaishnavi and Kuechler (2007); several great innovation games are documented in Hohmann (2006).

Based on the initial “design brief”, the first six sessions were used to define the service, its features and requirements through design thinking based workshops. A key moment in this process was when the group identified storytelling and serious games as central elements of the planned service. While serious games as a technique was initially left for later due to the importance of the required work, storytelling immediately appeared as a simple yet powerful approach for our service.

##### **4.1. The Use of Storytelling**

Stories help explain, engage imagination, spark new ideas, create a shared understanding, and persuade as argued in Quesenbery and Brooks (2010). Since one of the key requirements for the ThinkData.ch service was simplicity, both in terms of graphical interface and in terms of content, it was only natural that we relied on a storytelling approach to engage our target audience. Legal jargon is most of the time out of reach for non-specialists, especially when one has to deal with seemingly contradictory requirements in terms of data protection and transparency. We thus put a strong emphasis on writing scenarios that were easy to understand and included practical recommendations. We chose the narrative schema found in most fairy tales, like The Little Red Riding Hood:

- *Introduction*: the girl is asked to bring food to her grandmother;
- *Trigger*: the girl meets the wolf and changes her path;
- *Incident*: the wolf swallows the grandmother and the girl;
- *Resolution*: a lumberjack kills the wolf and saves them both;
- *Conclusion*: one should not go off the rails.

Biometrics < PREVIOUS | NEXT > BACK TO THE RESULTS | PDF DOWNLOAD

### Can I collect the biometric fingerprints of my staff?

**i** The management wanted to avoid its employees having a magnetic key to enter the building and to clock in. They decided to implement a biometric access control. Through an internal mail, the employees were invited to give their biometric prints (hand geometry and fingerprints).

**d** Three people were absent. When they were asked to explain their absence, they said that they had been informed that the use of such a device would be a serious breach of their privacy, and they refused to be subject to the collection of fingerprints.

**p** The management made more precise enquiries on the measures to be observed when installing and using such a system. They contacted the consultant for the protection of corporate data or the federal commissioner / cantonal. They summoned all employees to discuss the benefits of the new system. They explained to them that they had contacted the authorities and they could ensure that the system would not be misused, and that the data would be stored securely, etc.. One of the employees did not budge: "there are easier ways to control access to the premises, such as magnetic cards ..." The management then proposed a vote by show of hands. The three recalcitrant employees demanded that the vote be held by secret ballot.

**r** The ballots were counted: and the status quo prevailed. The management agreed that the proposed data collection was not proportionate to the aim and it was therefore necessary to obtain the consent of each employee. Given the cost and complications that would result from the presence of two parallel devices (magnetic and biometric), they postponed the project and promised to study a less intrusive one.

**c** The data collected to allow a biometric check can be used for purposes unrelated to the stated goal. The management is encouraged to look for a creative solution that respects the privacy of the employees.

**Figure 1.** ThinkData story and narrative schema.

This narrative schema is also emphasized graphically on the service through lettered bullets with visual floating indications when moving the pointer over them (rollover web design technique). This allowed us to structure all scenarios consistently (Fig. 1).

#### 4.2. Service Design and Implementation

Most of the second half of 2011 was spent specifying and designing the service from a features and interaction point of view. We did lose some time thinking of some fancy round radar like approach for tablets and surface computer. But when the time had come to actually implement the service, it became clear this would not be feasible. The implementation was given to a Web agency in late November 2011 in order to be able to do some testing before the launch in January 2012. The implementation cost was minimal. The respective institutions of the members of the project supported it. In 2012 our main achievements were the translation in German, Italian and English, as well as some new features such as a seal to show authoritative validation of the stories and their recommendations by an official data protection and transparency authority (Fig. 2). Other minor enhancements and features were included in this last release such as RSS feeds, news, donation button for fundraising campaigns, illustrations for the scenarios and comments on the stories. This second version was launched on the 2013 Data Protection Day (January 28, 2013).



**Figure 2.** ThinkData seal.

### 4.3. Description of ThinkData Service

ThinkData is an online interactive service designed as a simple website implemented on a content management system. Upon accessing the service homepage, users see a question, as a “teaser”, related to data protection or transparency displayed randomly on a carousel (Fig. 3). When clicked, the user is taken to the relevant scenario. Users can also choose to browse the stories by general themes (e.g., biometry, geolocation, surveillance, etc.), activities (e.g., HR manager, IS manager, employee, etc.) or data types (e.g., banking, personal, medical, etc.) Currently, the service holds around 50 scenarios available online. Users also have the possibility to submit their own stories to be included after being edited for the site and checked by data protection and transparency commissioners.

For each scenario, the service provides three key information blocks (Fig. 3). First a plaintext recommendation that outlines what has to be done in a very straightforward way. To some extent this can be seen as a best practice “how to” recommendation to help users undertake the concrete steps towards doing the things right. The second information block contains references to the relevant legal texts and principles prevailing in the described case. Finally, real life examples or external resources are linked to the scenario. These can include press articles, TV clips, or court rulings.

The image shows a screenshot of the ThinkData service interface, displaying three key information blocks for a scenario. The blocks are arranged horizontally and separated by vertical lines. Below the blocks is a green bar with the text 'RELATED SCRIPTS'.

Recommendations	Basic principles	Resources
The biometric data usually includes some sensitive data (particularly health). When this is the case, a formal legal basis is required and the persons concerned must be clearly informed and must consent to the processing of this data. The goal must be clear, and the most adequate and less intrusive measures must be chosen. These measures must be adequately communicated. In addition to this, the employer must also consult the employees or their representatives and, in the absence of a formal legal basis, obtain their free and informed consent prior to the introduction of an automated system for the processing of personal data.	LIPAD 38 and 42 ; LT 6 ; OLT3 26 ; CO 328 and 328b ; DPA 4 al. 4, 12, 13  Protection of privacy, protection of workers, the principle of proportionality: these measures must be necessary and the least intrusive possible.	The private bank Pictet & Cie in Geneva have been using 3D facial recognition to secure the access to its buildings since 2006. How did they overcome the fears of its 2,000 employees? Through communication. This technology does not monitor the health of an individual or violate their privacy. "The employees feared that their facial scan could affect their health, which is not the case because the machine simply films," says Jean-Pierre Therre, in charge of the security of the private bank. The database bank does not contain any photos of the employees either, but analyses the scans of their skulls according to the 40,000 reference points, and from which nothing can be drawn from. : <a href="http://www.1234economy.com/biometrie-et-reconnaissance-ce-faciale-en-3d-comment-la-banque-privée-genevoise-pictet-a-gere-les-resistances/">http://www.1234economy.com/biometrie-et-reconnaissance-ce-faciale-en-3d-comment-la-banque-privée-genevoise-pictet-a-gere-les-resistances/</a>

RELATED SCRIPTS

**Figure 3.** Resources linked to stories.

All scenarios can also be displayed on a single page (Fig. 4) where a filtering mechanism allows users to display only relevant scenarios, others being grayed out. In order to facilitate discovery scenarios are also displayed randomly on the page. Another feature is that users can download scenarios with a fixed layout in pdf optimized for print (e.g., for distribution to employees, supervisors or to use as reference material for training).

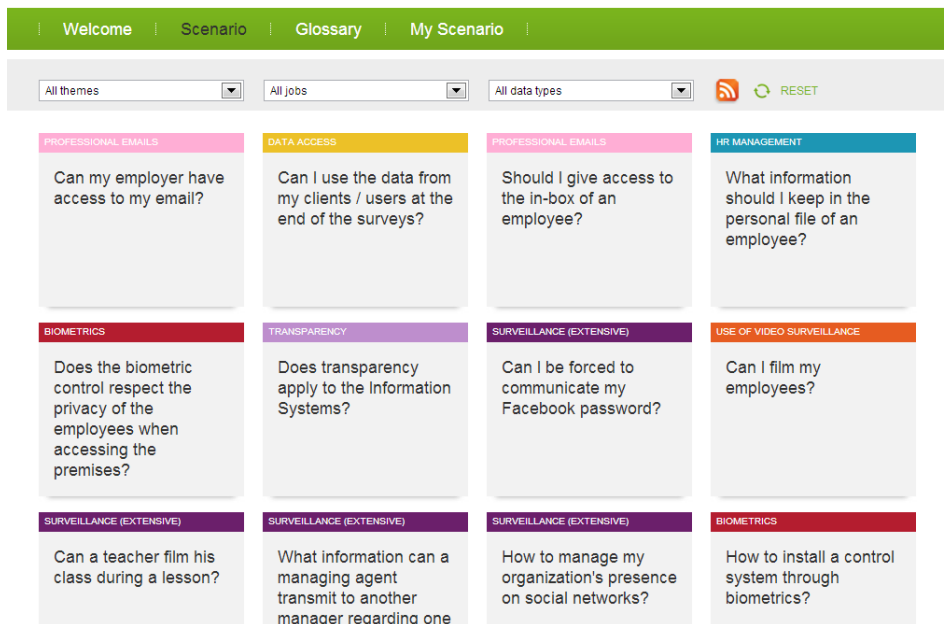


Figure 4. ThinkData story selection and filtering screen.

Finally users can submit their own questions, story ideas or issues. Data protection and transparency commissioners then rework relevant ones in order to publish them online as structured scenarios. As mentioned above, in the 2013 version we introduced a “ThinkData seal” (Fig. 2), in order to show that these recommendations were indeed validated by data protection and transparency commissioners, either at the Federal or at the Cantonal levels. Even if submitted questions or issues are not published, each contributor receives a personal answer or recommendation by the commissioners. In six months we published a dozen new scenarios and we even created a new stakeholder category, namely citizens. Indeed we received many requests on data protection and transparency regarding citizens’ everyday life. This led to extending our scope, even though it was initially limited to organizations.

## 5. Assessment of ThinkData.ch

The initial goal of ThinkData.ch was to bridge the gap between legal complexity and end-users’ understanding of data protection and transparency requirements. In order to do so we used the body of research on user satisfaction, most notably Wixon and Todd's paper (2005). They propose “an integrated research model that distinguishes beliefs and attitudes about the system from beliefs and attitudes about using the system”. To survey the behaviour of using technology Wixon and Todd rely on the well-known technology acceptance model (TAM) developed by Davis (1989). This theory suggests that users confronted to a new technology are influenced in their use by the:

- *Perceived usefulness*: Davis defines it as “the degree to which a person believes that using a particular system would enhance his or her job performance”;
- *Perceived ease-of-use*: Davis describes this as “the degree to which a person believes that using a particular system would be free from effort”.

We have not yet investigated these questions methodically, e.g. with an online survey for ThinkData.ch users or with interviews. However we had feedback on how the service is used:

- *As an FAQ screening tool for organizations on data protection and transparency*: some people reported using the service in their organizations to direct their employees to get

more familiar with data protection and transparency issues and to first check there for any related questions before asking the person in charge in the organization.

- *As a training tool in education and awareness training on data protection and transparency:* as part of the public administration training in Geneva, ThinkData is used within a course on data protection and transparency provided to state employees (State of Geneva Continuous Education programs 2012).
- *As a way to alert or warn on a potential data protection and transparency issue:* some people have reported using the *print your story* takeaway feature of ThinkData to actually give it to their managers or simply leave it on a table somewhere so other people can be alerted.
- *Personal verification use:* many people reported using the service to check on how their personal information are used and as a way to make sure that they are doing the right thing in potential data protection and transparency situations.

This gives us a few elements of response regarding perceived usefulness (service recommended to employees and used in training) and perceived ease-of-use (print a story and show it around). Of course this is only very preliminary and not based on scientific evidence. Future work will be the realization of an online questionnaire that ThinkData.ch visitors will be asked to fill when accessing the website.

Furthermore we wanted to assess the usability of ThinkData.ch, by measuring attributes of electronic services such as accessibility, timeliness, personalization, navigation or online facilities. In order to do so we used an assessment framework we developed in order to measure the “proximity” of eGovernment services (Glassey & Glassey 2004). The unit of measure used in this assessment is the Smallest Number of Clicks (SNC) to reach a given element of measure (Table 1).

Proximity Dimensions	Brief Definition	Elements of measure
<b>Communication</b>	SNC to find means of communicating directly with public administrations.	<i>Phone/Fax/Postal Address E-mail/Skype/IM/Twitter/Facebook</i>
<b>Up-to-dateness</b>	SNC to reach elements showing the temporal relevance of information or services or to access up-to-date information.	<i>Last update Newsletter “Push” services, RSS</i>
<b>Navigability</b>	SNC to find help and support or to reach navigation tools.	<i>Index Search engine Help, FAQ Return to homepage Personalization</i>
<b>Accessibility</b>	SNC to find elements guarantying that the portal is open to varied users.	<i>Navigation for handicapped Translations Use of life events or other topical navigation</i>
<b>Transparency</b>	SNC to find elements that help understanding administrative services and to give feedback regarding these services.	<i>Survey Data protection Official publications</i>

**Table 1:** Measuring Proximity of eGovernment Services

The version 2 of ThinkData.ch has all of these features available in one-click (or at the most two), apart from personalisation. This topic leads us to our next section, as we would need to develop a multi-jurisdictional model for ThinkData.ch in order to be able to give personal recommendations to users according to their localization (Federal laws in Switzerland are completed by Cantonal laws, and



in some cases the Cantonal law is more restrictive than the Federal one, e.g. in the case of data protection).

## **6. Generalization of the ThinkData approach**

In our opinion the generalization of the ThinkData approach could be done in two directions: (i) in the same thematic domain of making complex legal requirements more understandable and usable, by integrating multi-jurisdictional frameworks in our model; (ii) in other eGovernment domains such as eHealth or eTaxation, by reusing and adapting the design thinking and storytelling approach we developed.

### *6.1 Multi-jurisdictional Applications*

Based on existing international collaborations among the ThinkData team members, initial contacts were established with several data protection and privacy related agencies and commissioners in other countries in order to share our findings and the service. Among those, South Korea was identified as a likely early adopter of the ThinkData approach given their regular high ranking as number one in the United Nations E-Government surveys. In the latest 2012 survey their rank is respectively #1 for the E-Government Development Index and #1 ex aequo with the Netherlands for the E-Participation Index (United Nations E-Government Survey 2012). In November 2012, ThinkData was presented to the Privacy Protection Policy Division of the Korean National Information Society Agency (NIA). Korea has among the strictest laws on Data Protection and Privacy that entered into force in 2011. The initial approach they followed was a traditional Frequently Asked Questions (FAQ). The ThinkData approach appeared much more effective and appealing to NIA and they decided to implement a quick pilot of the ThinkData storytelling approach in December 2012. This was done with ten scenarios together with an assessment survey to measure service acceptability. The model used was based on a Task Technology Fit (TTF) and Technology Acceptance Model (TAM). Preliminary results indicate that 93% of the respondents are willing to use such a service on a regular basis. These results still need to be formally documented and reported. We actually plan to conduct the same survey in Switzerland and to combine our results in order to also assess the potential cultural differences between Asia and Europe.

Ultimately, our goal is to allow all interested countries to reuse the ThinkData approach in a non-commercial setting. It is for this reason that ThinkData has been released under a Creative Commons license (CC BY-NC-SA 3.0<sup>2</sup>) allowing to share and remix ThinkData under attribution, share alike and noncommercial conditions.

Further, assuming a network of ThinkData services, their interconnection in a linked open data way appeared as a promising direction to help address increasingly complex issues related to the evaluation of necessarily different jurisdictional approaches to data protection. Such interconnections would allow different countries to share stories together with their specific legal basis, thus offering new ways to compare how similar situations are addressed in different legal contexts. This could in turn offer new insights into how countries shape and design public policies and consequently their legal frameworks. In an increasingly globalized and interconnected world,

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<sup>2</sup> Creative Commons, <http://creativecommons.org/licenses/by-nc-sa/3.0/deed.en> (retrieved January 2013)

designing tools and services able to help address global scale wicked problems will become more and more necessary.

Several other interesting use cases can also be anticipated. First in the area of awareness, training and education in data protection, we contend there is an opportunity to help people better understand data protection, privacy and transparency in a way that is closer to users rather than lawyers. Therefore, a global awareness service relying on storytelling might be a promising outcome of a multijurisdictional approach of ThinkData. A second interesting use case can be anticipated in connection with how businesses assess and prepare themselves for global data protection. Many companies, including SMEs, need to deploy activities in different countries, thus facing the issue of how it impacts their operations. One value added service we have anticipated in this context is a service allowing to visually represent how different legal frameworks overlap, or not, thus providing a rather effective way to assess the impact and consequently the cost of doing business in that other context. Further, one could imagine using such visualization tools to study and even shape public policy reforms.

In the background of all these opportunities lie two key issues: first, in terms of representing the legal contexts (much work has been done in the area of legal ontologies and we will need to review the state of the art in this area); second, in terms of linking these different legal knowledge contexts together.

## *6.2 Design Thinking and Storytelling in eGovernment*

Whereas we have already done some preliminary work in the domain of multi-jurisdictional approaches, we have not yet developed concrete applications of our approach in other eGovernment areas. However we already have ideas for future work on the concrete case of eFiles. Indeed the problem of patient's or citizen's eFile is a very complex problem (what data are stored, who has access, for which uses, etc.) and we believe such an approach based on storytelling and serious gaming could be absolutely relevant to address these kind of issues.

## **7. Conclusions**

To conclude, we would like to open the discussion on a key question we think is worth tackling to address the challenge of designing people-centric awareness services on general complex legal and public policy frameworks. In other words, we hypothesized the value of Design Thinking and Storytelling are key factors to address this challenge. The ThinkData.ch case is a preliminary step towards establishing this. Our ongoing and future work in addressing the multijurisdictional dimension of the internationalization of ThinkData will provide good insights towards formal validation. The value of Storytelling will also be formally assessed through cross-cultural formal evaluation. Finally, the working group behind ThinkData is also including serious gaming in the evolution of the service in order to enhance the learning experience for users.

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