BIG DATA

Mapping of Danish and Chinese Universities, Industry, Policy and Promoters

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1. Executive summary of the innovation project on big data

Purpose of the report

Big Data is not a new concept, but one that is gaining traction and is rapidly finding new areas where it is applied. Advances in IT technologies and with rich information being stored in databases are providing opportunities for societies, companies and at the national strategic levels. Some areas has already benefited greatly from Big Data, such as the e-commerce business. Other sectors are demanding better acquisition and utilization of data to solve different challenges related to e.g. environmental, transportation, health or food safety areas.

The aim of the report is to gain a broad understanding of the big data industry in Denmark and China as well as to map relevant Danish players from the following four categories: Universities, Industry, Promoters, and Policy (see figure below).

This report is intended to serve both for internal use at Innovation Centre Denmark, Shanghai, as well as for Danish potential stakeholders such as companies, universities and policymakers. Both internally and externally, this report can serve as inspiration for formulating project ideas. The core contents in this report serve a starting point for e.g. match-making, technology scouting, market analysis, and business model development for Danish organizations.
Mapping-Criteria

The figure on the previous page outlines how the Danish and Chinese Big Data organizations and competencies are mapped into four categories: Universities, Industry, Promoters, and Policy.

Under each of these categories, you will find listed key entities with their competencies and contact details. Similar mappings are provided for both Danish and Chinese entities. Chapter 5 and 6 outlines some ideas for how these Danish and Chinese entities can be bridged in order to create e.g. joint events, partnerships and memorandum of understandings.

A Chinese cultural aspect has posed some limitations to the mapping for the Chinese entities. Generally, direct contact details to key contact persons are not accessible without well-thought out project ideas or concrete project proposals. Hence, a majority of the mapping from Chinese universities and other entities are provided without direct contact information.

Due to Big Data’s wide application areas, this report has selectively focused on certain industrial sectors. This selection is based on e.g. Chinese policy and strategic planning that overlaps with Danish competencies.

2. Key findings

Key findings

Big Data is a topic that receives much attention, with many articles, journals and report written about the topic (see reference list).

This report has mapped key entities within Universities, Industry, Promoters, and Policy categories for Denmark and China, as well as mapped areas where Denmark and China could collaborate for mutual benefits.

This mapping has generally been more successful for the Danish Big Data entities, yet it does provide a good overall foundation for further inquiries and discussion for joint opportunities. ICDK considers particularly that there is potential for Danish entities within the IT services, health care systems and transportation, and will actively pursue opportunities in these and other areas in 2015.
Value creation and concerns

Utilizing and implementing the outcomes generated in this report successfully could enable ICDK to aid Danish entities with exploring and preparing for pursuing opportunities in China.

However, one should be aware that collaboration with Chinese partners and exploitation of opportunities in China may not always be accounted for in initial mapping and scouting, as each project will have its unique circumstances. For example, there might be issues with data accessibility for certain projects. How openly can Danish companies get access to the necessary sorts of data? Which sorts of partnerships are necessary in order to enable access to such data? How can such partners be identified?

As it is impossible to anticipate the answers to such questions without considering specific cases, this report has been developed in a generic matter, so as to serve only as a starting point for further inquiry and exploration. However, opportunities in some selected industries are briefly highlighted in chapters 5 and 6.
3. Initiatives and competences from the Danish society

Complying with our mapping criteria introduced in Chapter 1, the following entities have been identified and sorted in the four categories: Universities, Industry, Promoters, and Policy. Each will be presented for Denmark and China, respectively. Detailed contact information have been provided where possible.

Universities and research institutes

**TECHNICAL UNIVERSITY OF DENMARK**
Specialized within Data Science and applied engineering.

**AARHUS UNIVERSITY**
Specialized within big data and organizational design.

**AALBORG UNIVERSITY**
Specialized within data intensive systems.

**COPENHAGEN BUSINESS SCHOOL**
Specialized within big data analytics and established big data forum.

**IT UNIVERSITY COPENHAGEN**
Specialized within socializing big data.

DTU Compute, DTU SkyLab
Name: Mads Odgaard
Title: Officer for innovation and sector services
Email: maod@adm.dtu.dk
Telephone: (45) 4525 1248
Initiatives: Big Data Conference
Links: [http://www.dtu.dk](http://www.dtu.dk)

AU
Name: Svend Binnerup
Title: Chief Consultant
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Initiatives: Big Data, Big Impact

AAU Center for Data-intensive Systems
Name: Torben Bach Pedersen
Title: Professor
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Initiatives: DAISY
Links: [http://daisy.au.dk/](http://daisy.au.dk/)

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Telephone: (45) 3815 3375
Initiatives: Big Data Forum

ITU – TIP technologies in practice
Name: Pernille Bjørn
Title: Assc. Professor
Email: prba@itu.dk
Telephone: (45) 7218 5272
Initiatives: Socializing Big Data
Links: [http://itu.dk/tip/?p=2652](http://itu.dk/tip/?p=2652)
Industry companies and players

**DTU TRANSPORT DATA AND MODEL CENTER**
Specialized within data and models in transport. Have broad knowledge over existing Danish models of transport and its relevant data.

**DANISH MEDICAL DATA DISTRIBUTION**
Founded in 2004 by four companies who specialize in and produce electronic patient record systems for the primary health care sector in Denmark; specializes in structured and intelligent communication in the health care business.

**ATEA DENMARK**
Leading IT provider in Denmark; has influential big data and analytics experts on board; highly visible in the press and media.

**COMMIT APS**
Leading expertise in Big data, high performance systems and cloud solutions. Provide solutions, data science, expertise, and training.

**ATHENA IT-GROUP**
Denmark’s first “BigData as a Service” provider in collaboration with IBM. Provide other services such as: IT-outsourcing, hosting/cloud.

**TRANSPORT DATA & MODEL CENTER**
Name: Britt Zoega Skougaard
Title: Data and analysis specialist
Email: hrs@transport.dtu.dk
Telephone: (45) 4525 6520
Initiatives: Transport Data Modeling
Links: [http://www.transport.dtu.dk/](http://www.transport.dtu.dk/)

**DMDD**
Name: Jørgen Granborg
Title: Chairman at Danish Medical Data Distribution
Email: joergen@webreg.dk
Telephone: (45) 7572 0177
Initiatives: Electronic Patient Record Systems
Links: [http://www.dmdd.dk/](http://www.dmdd.dk/)

**ATEA**
Name: Kim Gregers Petersen
Title: Big Data & Analytics
Email: info@atea.dk
Telephone: (45) 7025 2550
Initiatives: influential Big Data expert
Links: [http://atea.dk/](http://atea.dk/)

**Comit ApS**
Name: Rasmus Nygaard Andersen
Title: Project leader
Email: info@comit.com
Telephone: (+45) 6166 5562
Initiatives: Big Data Denmark
Links: [http://comit.com/](http://comit.com/)

**Athena IT-Group**
Name: Jens Erik Thorndahl
Title: CEO
Email: jet@athena.dk
Telephone: (45) 2835 5096
Initiatives: Big Data as a Service IBM partner
Links: [http://www.athena.dk/](http://www.athena.dk/)
Organization and active promoters

BIG DATA INSTITUTE
A competence centre that provides training, advice and assistance into value-adding Big Data analysis.

DANISH INDUSTRY
Danish industry organization with strong sector expertise; promoting big data related concepts and activities through various highly visible channels.

INSPARI A/S
From data to knowledge and value; business intelligence software analysis for optimum organizational decision making. Gazelle company 2010-2014.

VÆKSTHUS NORDJYLLAND
Regional growth house in Jutland Denmark, actively promoting big data concept and activities through workshops and events.

VIBORG KOMMUNE
Viborg municipality has a unique strategy with the vision to utilize animation into healthcare, business, culture and public administration areas. Their strong sector competence is highly valuable and is an asset able to create global success in the interactive industry.

BIG DATA INSTITUTE
Name: Michael Jannis Pedersen
Title: Project leader
Email: mj@bigdatainstitute.dk
Telephone: (45) 4121 0550
Initiatives: Big Data Analysis and training
Links: http://bigdatainstitute.dk

Dansk Industri
Name: Christian Graversen
Title: Chefkonsulent
Email: cgra@di.dk
Telephone: (45) 3377 3513
Initiatives: Data Driven business development
Links: www.di.dk

INSPARI
Name: Jens-Jacob Thuen Aarup
Title: Director and Partner
Email: jja@inspari.dk
Telephone: (45) 2026 8660
Initiatives: Big Data service provider
Links: http://www.inspari.dk/datalicensed/
Public sector and policies

**DANISH BUSINESS AUTHORITY**
Report *Big Data as a growth factor in Danish Business*; case stories; use of big data in Danish companies is still in its infancy; two types of Danish companies: young enterprises who use public data in product development vs. bigger companies who use business intelligence for decision making.

**DANSK ERHVERV**
Suggested to the government to establish a national Big Data entity based on public-private partnership, to realize potential of vast amount of data.

**ACCURA ADVOKATPARTNERSELSKAB**
Leading Danish law firm; shared professional insights on big data – legal challenges to the commercial exploitation;

**OPEN DATA AARHUS**
Regional project to make data freely available to support productivity and innovation, business and service formation through greater use of data.

**IBIZ-CENTER**
Aim at strengthen the SME utilization of IT in the business process by increasing awareness and knowledge about e-business; Insights on Big data in smaller enterprises – potentials and barriers.

**ERHVERVSTYRELEN**
Name: Preben Gregersen  
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Telephone: (45) 3529 1750  
Initiatives: Big Data as growth factor  
Links: http://erhvervstyrelen.dk

**Dansk Erhverv**
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Initiatives: Big Data Conference  
Links: https://www.danskerhvervy.dk

**ODAA**
Name: Michelle Bach Mikkelsen  
Title: Project leader  
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Telephone: (45) 4185 6641  
Initiatives: Open Data Aarhus  
Links: http://www.odaa.dk/om-odaa

**IBIZ-CENTER**
Name: Jan Overgaard  
Title: Center leader  
Email: jan@ibiz-center.dk  
Telephone: (45) 7220 2022  
Initiatives: Big Data in SMEs  
Links: https://www.ibiz-center.dk

**ACCURA Advokatpartnerselskab**
Name: René Thornfeldt  
Title: Advokat, Partner  
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Telephone: (45) 3945 2908  
Initiatives: Juridiske udfordringer  
Links: www.accura.dk
4. Demand, market trend and policies in China

In this chapter, the mapping result of the highly visible entities in the Chinese market is briefly listed. This information contributes to the following chapter, where concrete potential collaboration possibilities are suggested.

Universities and research institutes

The five universities listed with their logos below have recently joint alliance to create collaborative innovation platform and to establish master programs on Big Data Analytics. They will utilize their respective strengths within e.g. statistics, computer sciences, and economics and management disciplines to cultivate the master degree educations within Big Data.

These five universities are:

- Renmin University Of China
- Beijing University
- The Chinese Academy Of Sciences
- Central University Of Finance And Economics
- Capital University Of Economics And Business

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1 This chapter is lacking in more detailed information about Chinese universities’ relevant departments, strongholds and competencies, and other data which was provided for the Danish universities above. ICDK will update this section with the relevant information as soon as possible.
The aim is to educate more specialists as a response to demand of data analytics talent from companies and the government. The collaborative innovation platform aims at creating synergies and integration between politics, industry, research and education.

Apart from the above universities, there are also other leading Chinese universities with expertise in the field of Big Data, for example, a few more technical universities include:

- Tsinghua University
- Beijing Jiaotong University
- Beijing Institute Of Technology
- Nanjing University
Companies and main players in the industry

Some Chinese companies stand out in terms of Big Data application in their business. The following is a selection of best-practice companies from China.

**ALIBABA GROUP**
E-commerce company with vast amount of data within online shopping, payment, mobile payment, logistics, disruptive banking services, etc.

**TENCENT**
Leading Chinese mobile internet company with vast customer data within social media, gaming, messaging, payment services, etc.

**SUNING**
Retail giant, has vast user data within e-commerce, payment, gaming, etc.

**CHINA MOBILE**
Leading telecom operator, actively experimenting Big Data Analytics.

**HUAWEI**
Big Data and Cloud Storage technology, equipment and service provider

**BAIDU**
Web services provider, search engine, with big data engine to provide big data storage, cloud computing analysis and research technology services.

**AMAP**
Leading software company and service provider for digital map content, navigation, and location based services.

**INSPUR**
Big Data solution provider for the Ministry of Transportation on project *City public transportation cloud*, which covers all the system's functionalities.

**NEUSOFT**
Neusoft medical owns XIKANG, a healthcare service provider that integrates resources of regional medical centers and community healthcare facilities.
Public sector and policies

MINISTRY OF INDUSTRY AND INFORMATION TECHNOLOGY, MIIT
Chinese Academy of Telecommunication Research of MIIT published the Big Data White Paper that contributes to policy making in this industry.

NATIONAL DEVELOPMENT AND REFORM COMMISSION, NDRC
Primary responsible for the comprehensive study of the formulation of economic and social development policies. Approves the establishment of e.g. national key state laboratory of Big Data platform technology.

SHANGHAI MUNICIPAL DEVELOPMENT & REFORM COMMISSION
Released policy guidelines for the Shanghai new three-year plan for smart city; and the Shanghai action plan for the promotion of Big Data research and development.

NATIONAL HEALTH AND FAMILY PLANNING COMMISSION
Released the 3521 project to build a 3-layer regional healthcare information network; strengthen 5 services; 2 basic databases electrical health record and electronic medical record; and 1 dedicated healthcare network.

MINISTRY OF TRANSPORT
Released the main technical policy on transportation for highway and waterway. This technical policy covers 7 areas including urban transport, safety emergency, environmental protection and information technology, etc. and is composed of in total 70 major policies.

INTERNET SOCIETY OF CHINA
GNO made up of 140 members of the Chinese internet industry including private companies, schools and research institutes. It supports MIIT, Ministry of Education, and the State Council Information Office, and act as regulator for the internet industry.
Organizations and promoters

THE BIG DATA CN
The very first non-profit Big Data portal in China. Offers Big Data related technology, application cases, aggregates all Big Data related information, an online forum to discuss Big Data related topics.

CHINA BIG DATA ASSOCIATION
CBDA is a branch of China Information Association, established in Aug 2014, approved by NDRC. It is a voluntary NGO composed of industrial Big Data professionals.

URBAN DATA PARTY
An interactive community platform focused on city data and smart city. Offers: open source data; training materials; communication forum; members composed of regional industrial alliances and key research laboratories; has an expert board composed of professors and industry experts.

NATIONAL INDUSTRY ALLIANCE OF SMARTCITY TECH INNOVATION
The alliance gathered competitive enterprises, universities and research institutions that cover various aspects of the entire industrial value chain. Aims to develop and establish the Big Data system that fulfils the urban management, operation and maintenance requirements.

DATA CENTER INDUSTRY ALLIANCE OF CHINA
Supported by authorities such as NDRC, MIIT and China Information Association. Established six expert committees in areas of investment and financing, market operations, customer services, green energy, cloud computing, construction, operation and maintenance. Brought together the outstanding experts from domestic data centres.
5. Collaboration areas with high potential

With competent entities from Denmark and China having been mapped in the previous two chapters, we now turn to a few industry sectors in China which we evaluate as having high potential. These are industries affected by the growth in mobile internet such as e-commerce and finance, and potential value creation in health care systems and transportation systems.

Mobile internet

With the Chinese growth in mobile internet, Big Data related to e.g. e-commerce and finance is gaining momentum in China. Chinese consumers are using mobile internet to shop physical goods, consume digital content and are active on social media. Some of the Chinese companies presented on page 13 are dealing with hundreds of millions of users and consumers, and have developed competencies in using Big Data generated to improve their services and businesses. Understanding the users and customers can be used to create competitive advantages for companies in these highly competitive industries. The implications for Danish companies are that there may be a lot to learn from these companies to apply in Denmark, as well as great potential to improve the Chinese companies’ big data analytics.

E-commerce

E-commerce is increasingly supplementing and/or replacing traditional brick-and-mortar shopping. One benefit of e-commerce is the rich data generated about the customers. This data can provide useful insights that can be translated into competitive advantages. The e-commerce giant Alibaba processed $9.3 billion on the Chinese shopping festival on 11.11.14 alone, a number that is unmatched anywhere in the world. Hence, there are great opportunities for Danish companies to learn about Big Data applications in e-commerce in China, as well as a large potential in providing superior analytics services.

Danish entities working with mobile payments have already visited China on an inspirational tour in 2014. Mutual interests from both Danish and Chinese entities were indicated.
IT services and infrastructure

As China is modernizing and seeking to unlock e.g. productivity growth in the society, there is much potential in IT services and infrastructure. Denmark is quite advanced in terms of data monitoring in its general infrastructure, and we imagine Denmark being able to provide China with guidance. Health care systems and transportation are outlined as two examples below.

Health care systems

What contributed to our recommendation for promoting collaboration into the health care systems are the governmental agenda stated in the 3521-project on page 13. Denmark’s medical distribution entity (see page 8) provides electronic patient record systems for the Danish health sector. China could benefit from installing similar infrastructure. Big data generated in the health sector could adversely affect the value of health services in China. Building electronic health- and medical record databases could be a good first step for gathering Big Data in the Chinese health sectors, and could potentially be established by collaborating with Danish experts. Memorandums of understanding between Chinese and Danish stakeholders would be an important first step.

Transport systems

Experts suggest that if information about traffic conditions are analysed and coordinated, can improve a city’s throughput by 270 %. With the number of vehicles doubling every 3-4 years in some Chinese cities, adding to the current congestion problems, we find there is potential to gather and utilize such intelligence.

The Danish Transportation Data and Model Center based in the Technical University of Denmark and relevant research institutions in China, such as the Chinese Academy of Sciences and Beijing Jiaotong University could collaborate on knowledge exchanges with aim to design such systems. We recommend memorandums of understanding across cities, for example between the entity Open Data Aarhus and a Chinese municipal development and reform commission in e.g. either Beijing or Shanghai. A well-established MoU will make a valuable foundation for carrying out forthcoming commercial activities.
Final remark to the report

This report with its mapping result is intended to be used as a small handbook to facilitate sector responsible or commercial officer in their initial search for potential contact and entities to build potential collaborations in the Big Data related industry areas between China and Denmark.

This report is not a round-up but rather an opening up of this entire area – for creating various joint activities between the two lands. Follow up research and initiatives for activities to bridging stakeholders from both countries will be constantly maintained in the coming year 2015.
6. Appendix

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