What are the effects of data portability?

Each time we do something online, we generate data, and our online activity is increasing all the time. Over 90% of the world's data has been created in the last two years, and this dramatic increase is predicted to continue as technology becomes a bigger part of our lives. But, as we navigate through the online world, moving between websites and shopping at different online retailers, how does our data 'move', and what are the effects of this movement between different companies? At the **University of Calgary** in Canada, **Dr Hooman Hidaji, Dr Barrie R. Nault** and **Dr Vaarun Vijairaghavan** are studying data portability and how it affects customers and businesses.

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PROFILES

Field of research
Business technology management

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Talk like a ...

business technology management researcher

Customer-generated or user-generated data — data on customers that has been created by their own actions, such as their comments on social media or their financial spending

Data controllers — companies with access to customer-generated data

Data portability — the ability to transfer (or port) your own data from one company to another

Data portability regulations (DPR) — standards and regulations that make data portability a legal requirement that companies must adhere to

Companies have access to a huge amount of user-generated data – ranging from our social media habits, the websites we visit, our online shopping orders, and health data from fitness apps. This data is valuable for businesses because it can help them market their products or services according to consumers' tastes and habits. Because of this value, there are regulations in place to ensure individuals can move their information between companies or keep it private. At the University of Calgary, researchers Dr Hooman Hidaji, Dr Barrie R. Nault and Dr Vaarun Vijairaghavan are investigating the effects of data portability – the ability to transfer data between different companies – to see if the regulations and policies surrounding it are the best they can be.

"The main data portability regulations that are currently in use are the General Data Protection Regulation in the EU and the California Consumer Privacy Act in the US," says Vaarun. Regulations like these force companies to allow customers to move their data (if they wish to) and are supposed to bring benefits for both customers and businesses.

What is user-generated data?

There are lots of different types of user-generated data. "One of the most common is where users interact with platforms, for example in the form of comments, posts and likes,"

says Barrie. This type of data might include which websites you click on and who you follow on social media.

The next type of data is when users interact directly with companies, either through buying an item or reviewing it. Think of your playlists and listening history on Spotify, the channels you subscribe to on YouTube or a purchase you have reviewed online.

Specialised platforms have more specific types of data too. "For example, in fitness and activity tracking apps, users record detailed data about their activities. Banks have information about users' finances, utility providers know users' usage and behaviour, and in travel applications, companies have information about previous trips and preferences," explains Vaarun.

What are the benefits of data portability?

Data portability gives people the ability to move all this information between different companies. One of the main benefits of this is convenience – you might notice this, for example, when you transfer your financial data from your bank to a budgeting app to help you save money.

Data portability also allows consumers to control their own data, meaning they can switch to new services easily.

Businesses benefit from data portability as it allows them to provide a better service to new customers who bring their previous data with them. For example, a customer's new heating supplier can set them on the correct tariff based on how much electricity they have used in the past. Finally, data portability is also meant to increase competition. "It is believed that by allowing smaller or newer firms to access user data, it improves their ability to compete with larger firms," explains Hooman. The idea is that by being able to transfer previous data to small or new companies that otherwise would not have access to this information, the new companies will be able to provide a similar standard of service to that offered by better-established companies, therefore adding more competition into the industry. More competition in an industry typically results in better services and deals for consumers.

What is the team working on?

Hooman, Barrie and Vaarun are investigating whether data portability does, in fact, improve competition. To do this, the team is using an analytical modelling approach to examine case examples. The team models – that is, writes equations to represent – the different decisions that users, platforms and policymakers make. "Users choose the platform that is best for them. As the 'data controller', the platform decides what to make available to users and whether to allow data portability. The policymaker decides whether to fine platforms that do not allow portability and whether to invest in ways to make data portability easier," explains Vaarun.

Once these decisions have been modelled, the team uses 'backward induction' to gain insights and predict the impact of policies. "We figure out what users do, based on what the platform offers, then what the platform chooses, based on what the policymaker does, and, finally, what tax or investment policy the policymaker puts forward," says Barrie. "The results provide insights and predict the impact of policies."

Hooman adds, "A typical day for us involves a lot of discussion about the phenomenon at hand (in this case, data portability). Modelling with mathematical equations allows us to focus on specific aspects of a problem and uncover the mechanisms that drive stakeholders' decisions."

What has the team learnt?

So far, Hooman, Barrie and Vaarun have found that regulations on data are counter-effective to improving competition. "Contrary to the goal of the policies, data portability regulations often result in less competition – fewer firms in the industry and higher market concentration among a few firms," says Hooman. "Based on this, we see the impact of data portability regulations on competition to be generally negative."

What will the team do with this research?

"We hope our findings allow policymakers to make better judgements when deciding to implement data portability regulations. If the aim is to improve competition, they should modify the current data portability regulations," says Vaarun.

"We also plan to analyse other aspects of data portability regulations, such as portability across industries," says Barrie. Data technology is an emerging field that is only going to become more important to businesses and consumers. The team will have much to research in the future!

About *business technology management*

Business technology management, also known as management of information systems, is an emerging field that combines information technology, data science, business and management to help improve how information is passed within and between organisations.

Over 400 million terabytes of data are now created each day, so lots of critical work and research are needed in this field. "We are immersed in technology, and management of technology is essential for all firms, irrespective of their size or industry," says Vaarun. "All firms need to manage data, and this determines their competitive advantage."

"Our research is relevant to what is happening in the real-world, and this makes it very fulfilling and interesting," says Hooman. "It provides us a lens to view the underlying mechanisms that drive technologies and business decision-making. It also provides an insight into the impact of regulations on businesses and users."

"Given the extent to which society uses technology and information technology, there is a wide range of opportunities available to the next generation of researchers in this field," says Barrie. "This includes, but is not limited to, analysis of different aspects of data and its use in society, artificial intelligence, digital platforms, e-commerce, investments in technology and technology supply chains. Each of these topics includes an expansive set of research questions that require further studies."

Pathway from school to *business technology management*

Get a strong foundation in mathematics, as well as anything your school offers that is technology or business related. "It is critical to have a good grasp of quantitative topics such as mathematics and statistics. These are fundamental to our research," says Hooman.

At university, choose a degree in technology such as computer science, data science, electrical engineering or information technology. Whichever degree you choose, Vaarun recommends taking economics courses if you can.

Read through the University of Calgary's Business Technology Management Program to see what studying business technology management entails: **ucalgary.ca/future-students/undergraduate/explore-programs/business-technology-management**

After your undergraduate degree, you will need to complete a master's degree and a PhD to do research like Hooman, Vaarun and Barrie.

Explore careers in *business technology management*

"Follow technology news to determine your interest and to generate ideas," says Hooman. "A great place to look for this is in outlets that publish simplified versions of research for the general audience, for example **theconversation.com** and **theglobeandmail.com**, as well as in technology-oriented outlets such as **theverge.com** and **engadget.com**."

Nowadays, being able to manage technology and data is relevant to every company and every industry across the world, so working in this field can lead to a wide range of jobs. Read these articles on Indeed for an insight into what it is like to work in industry, rather than as a researcher: **indeed.com/career-advice/finding-a-job/technology-management-degree-jobs** and **uk.indeed.com/career-advice/finding-a-job/how-to-become-technology-manager**

Meet *the team*

Hooman

I have always been interested in technology, and more recently, its impact on our lives. I particularly find the transformative effects of platform-enabled technologies fascinating, as well as how policymakers aim to limit their negative effects on society.

Many of my research ideas have been conceived while interacting with a particular new technology or tool, or in following how society engages with them. Discussions with peers and colleagues about such phenomena have also generated several interesting paths.

I like taking breaks from projects and have found that switching from one to another helps resolve challenges. I often let a project sit for a while when I find myself stuck, and I keep thinking about the questions and problems even when I am not working.

The most impactful moments in my career are my successful research projects and their impact on society, especially in guiding policymaking. Then, there is the success of the next generation of students who I have taught and mentored.

I plan to keep researching technology, policymaking and the impact both have on our lives.

Hooman's *top tip*

Follow your interests. It is always hard to do something that you don't like, but particularly in research and academia.

Barrie

Having been interested in how accounting kept track of things in a logical way, I then found math and statistics provided more sophisticated ways to analyse situations. I realised that information technology was what was changing the world we live in, and specifically how businesses could coordinate.

As an undergraduate research assistant, I liked the time flexibility that I saw my professors enjoying. The intellectual challenges and independent work they faced also appealed to me. After working in industry for a few years, I started a PhD. I grasped the idea of abstraction – how we could write down equations that represented different settings and could be analysed. I realised "that's how this is done!"

Once you really commit to doing research, there is no switching off! Even when you are not consciously working on a problem, your subconscious is. Doing activities that are not research work is important to refresh your subconscious and, of course, to lead a varied life.

The highlights of my work are the people I have had the chance to work and make discoveries with – from my thesis supervisor and a senior mentor who were not only my co-authors but great friends, to my colleagues now, and the incredible PhD students I get to help. All these people have taught me valuable things.

Barrie's *top tip*

Put your head down and try. It's not about how fast you understand things, rather it is about how deeply you understand things.

Vaarun

My journey into business began with my bachelor's degree in engineering and my first job as a software developer. A few years into my role, I started engaging with business users to understand their requirements and lead a team of developers. This initial exposure to the business side of things sparked my interest. I pursued a master's degree in business administration and then went on to gain my PhD – my proudest career achievement. I have been involved in research ever since.

As a social scientist, I've learnt that people have an incredible capacity to make good decisions. Our society is made up of interdependent individuals, and when each person can make decisions for themselves, we all benefit. However, when people are told what to do or, worse, forced to do things against their will, it leads to negative outcomes. This realisation has underscored the importance of carefully considering the rules we establish within our society.

I want to improve conditions for people in my country and around the world, focusing on one of the most important modern phenomena – technology. By generating knowledge and informing policymakers and society about my findings, I hope to contribute to a stronger and happier society.

Vaarun's *top tip*

No matter which field you choose to contribute to, find a mentor you look up to and who can teach you a range of things in depth.