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1. Disruptive Technologies: Impact Assessment

1.1 Introduction

Digital commerce is now over 2 decades old; Amazon was launched in 1994. However, this 'new' channel for shopping is nowhere near fully-formed, quite the opposite in fact. A collection of emergent technologies is combining to take digital commerce in fresh and exciting directions.

In this research, we examine these new ideas and attempt to rank them by impact. Broadly, the big changes taking place can be grouped into 4 areas.The first concerns the medium on which the transactions take place. We have already seen a shift from the desktop to the tablet and mobile and this process will accelerate. As it does, this will affect shopper making payments, with biometrics heralding the most immediate change. The mobile is also helping product discovery through features like AR (Augmented Reality) and image recognition. Further ahead, we could see payment enabled inside 'things' such as jewellery and even outsourced to objects like meters and appliances.

A second area of change concerns currency itself. The digitisation of money and the rise of smartphones make it possible to hold many different currencies, eg one for each retailer, in a single electronic wallet. Starbucks is the best current example and we could see an explosion of many more of these. However, there are more profound possibilities. For example, consumers could turn their private data into currency and trade it for goods and services. Further ahead is the promise of purely digital currencies such as Bitcoin.

A third disruption will impact discovery and the checkout. Even after 2 decades, cart abandonment (shoppers giving up on a transaction because of lengthy form filling) remains a huge problem for digital merchants. This is another area in which biometrics is having an impact. However, it is also prompting retailers to consider outsourcing their checkouts to third parties that already possess a shopper's credentials. Hence the fresh interest in 'buy' buttons on social media sites. This problem is also inspiring new players (banks, governments, telcos) to provide speedy and secure 'federated' identity services.

Finally, there are disruptive ideas coming to the infrastructure behind transactions to make them safer and speedier. The financial services industry is embracing tokenisation as a means of making transactional data worthless to criminals. Meanwhile regulation is forcing banks to open up their APIs (Application Programming Interfaces), could unleash an explosion of innovation around payments. Further ahead, there is the blockchain, promising to transform the 'rails' on which transactions and, indeed, all kinds of record-keeping are carried out.

In order to rank these technologies, we have examined their impact in 7 areas:

- How they affect the consumer experience;

- How they impact the B2B (Business to Business) space;

- The extent of regulatory barriers;

- Technological clarity, shared industry standards;

- Security concerns;

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- Quality of user experience

- Ecosystem readiness, is there a settled value chain?

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Table 1.1: Digital Commerce, Disruptive Prospects: Impact Assessment Heat Map

	Consumer Impact	B2B Impact	Regulatory Barriers	Technological Clarity	Security	Quality of User Experience	Ecosystem Readiness
Biometrics	dark green	dark green	dark green	yellow	light green	dark green	light green
Federated Identity	dark green	dark green	dark green	light green	yellow	light green	yellow
Tokenisation	yellow	light green	dark green	light green	light green	dark green	light green
Social Commerce	yellow	yellow	light green	dark green	light green	light green	yellow
Open Bank APIs	orange	orange	yellow	light green	light green	light green	yellow
AR & Scan-to-Buy	orange	orange	orange	orange	light green	light green	yellow
Privacy as Currency	orange	orange	light green	orange	light green	light green	orange
Blockchain	orange	light green	red	yellow	light green	yellow	orange
Virtual Currencies	orange	orange	red	yellow	yellow	orange	yellow
Payment by Things	orange	red	red	orange	orange	light green	orange

Source: Juniper Research

The following table outlines how we have categorised the impact (or potential) of each technology, by factor:

Table 1.2: Impact Assessment Heat Map Key

	Consumer Impact	B2B Impact	Regulatory Barriers	Technological Clarity	Security	Quality of User Experience	Ecosystem Readiness
dark green	Now		Very Low	Agreed Standards	Highly Secure	Very High	Very Well Established
light green	Within 6 months		Low	Converging Standards	Secure	High	Well Established
yellow	Within 1 year		Medium	Some Competing Standards	Medium		In Formation
orange	Within 2 years		High	Many Competing Standards	Vulnerable	Low	Unformed
red	Within 5 years		Very High	No Agreed Standards	Highly Vulnerable	Very Low	Chaotic

Source: Juniper Research

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1.2 Disruptive Technologies: Ranking Summary

The above heat map ranks the technologies under discussion according to which will have the greatest impact in the quickest time. The following section provides an overview of these technologies, ranked in order of the scale of their anticipated impact.

1.2.1 Biometrics

Consumers are already making use of biometric authentication to drastically speed up mobile web and app transactions. Clearly the difference between pressing a fingerprint and filling out a lengthy payment form on a small screen is marked. It makes a material difference to both shoppers and merchants.

So biometric authentication is having a positive impact on digital commerce. Of course, there are caveats. It is possible, for example, to create a fake fingerprint from rubber, but how worthwhile is the effort required to spoof just one device? While there is some standardisation in the space (thanks to Apple and the FIDO Alliance), it is not entirely settled. There is still experimentation with facial recognition, heartbeats and more.

1.2.2 Federated Identity

When a merchant can correctly identify a customer, it eradicates the big problems that plague digital commerce; theft, fraud and sabotage. It also helps retailers to market and personalise their services, but consumers hate registration form-filling. This is why third parties, who hold personal information, now offer a shortcut sign-in. These partners include banks, government, mobile operators, social networks and big tech firms like Apple and Google.

Federated identity is well-established and offers a good consumer experience. However, it is not 'done'. Some merchants have competitive issues with the dominant provider Facebook and are also aware that newer providers can promise stronger authentication in their systems. Apple can link its ID to a fingerprint; mobile operators to the location of their devices, for example. These qualities make identification faster and more reliable.

1.2.3 Tokenisation

Digital commerce relies on 'card not present' transactions. This leads to merchants storing payment credentials on their systems and those same credentials travelling OTA (Over The Air) from consumer to retailer. As many high profile cases have shown, criminals habitually steal this data. Tokenisation has emerged as the key technology for combating this.

Tokenisation does not try to make data harder to steal, it makes it harder to use. It replaces card details with a unique token that is linked to the account, but in itself is worthless. The technology is already in use; Apple implemented it for Apple Pay, Android Pay and Samsung Pay use it. Tokenisation has also been endorsed by the newer mobile payments processors like Stripe and Braintree, who power apps like Uber.

Meanwhile Visa, MasterCard and American Express have launched tokenisation platforms so that payment intermediaries do not have to enter into complex bilateral agreements with banks to tokenise payments. So tokenisation is already having an impact and, in time, the idea may

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extend beyond payment and into digital identity, with tokens used as proxies for identity on dating sites.

1.2.4 Social Commerce

Brands commonly use social channels for marketing and discovery. The big question facing eTailers now is: will consumers actually shop there too? Social commerce has failed before; Facebook notably launched payment systems and abandoned them. Many startups, eg Motilo, Fashism and Snapette, have folded or pivoted. However, in 2015 there was a revival of the idea of 'buy buttons' on social media sites.

Crucially, these buttons enable users to purchase items within the social app or site, rather than directing them to the merchant's own eCommerce destination. This speeds up the buying process and, if the consumer has already logged their details with the site, it reduces checkout to a few clicks. Pinterest, Twitter, Facebook and Instagram, to varying degrees, all launched services in 2015.

The ecosystem is becoming established, but the fundamental question remains; do consumers want to shop in places that are not natural destinations for commerce? Even if they do, there are still problems. Are merchants happy to outsource their checkouts? Can the systems cope with inventory issues?

1.2.5 Open Bank APIs

Facebook, Amazon and others use APIs to let people interact with their services from any other site or app. The EU thinks banks should do the same. In 2017, the Payment Services Directive 2 will mandate that banks have to open their APIs in EU member states.

This could have a significant impact on digital commerce in Europe. It gives intermediaries the ability to ask the consumer to grant access to his/her bank account to make a payment. This can make payments faster and, as consumers are not obliged to enter their card details, merchants no longer need to store payment credentials. These intermediaries already exist, eg Trustly, Sofort and iDeal, but the new law could bring many more to market. However, there are questions over the technical ability of banks to open up their APIs. Some reports suggest they may not be ready by 2017.

1.2.6 Privacy as Currency

In a climate of growing concern about online privacy, a new idea is emerging; why not let people trade personal information with favoured merchants for goods and services? A small number of startups want to give users personal lockers they can fill with private credentials and data based on the sites they visit. Users can open some or all of it to businesses as they wish.

This is not a new idea; the Locker Project, Enliken and others tried it before. Now a new generation of companies, like CitizenMe, Handshake and Datacoup, is taking a fresh approach using apps. They are improving the user experience with psychometric quizzes that turn profiling into a game. Their challenge is gathering a critical mass of sellers (consumers) and buyers (brands/advertisers).

1.2.7 Augmented Reality & Scan-to-Buy

Offline-to-online commerce is an idea with immense promise. The idea of photographing an image to buy an item is hugely compelling, but very complicated. Tagging images to correlate to accurate checkout

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information is a major challenge, as is finding a methodology that mobile shoppers can embrace. They do not seem to like QR (Quick Response) codes.

One possible solution is AR, wherein visual markers trigger rich graphic experiences on the screen. AR is not new; start-ups like Blippar, Zappar and Aurasma launched in 2011. 5 years on, AR commands an 'experimental' marketing budget only. However, investors appear positive. Blippar raised $45 million in March 2015 on a promise that it can turn every piece of packaging into a shopping cart. VCs (Venture Capitalists), led by Google, also invested $542 million in AR innovator Magic Leap, while Apple bought Metaio in 2014. If, as some speculate, Apple were to embed AR inside maps, it could bring the technology to a huge audience.

1.2.8 Blockchain

The digital commerce world needs trusted intermediaries to manage transactions. Otherwise how would we ensure the same money isn't spent twice? Intermediaries charge high fees and can be slow to complete transactions; they can also be fraudulent. The blockchain tackles this by connecting buyers and sellers to an immutable digital ledger of all transactions. The ledger is monitored by everyone, but is ultimately controlled by no-one.

The blockchain could be a world-changing innovation, bringing safe and transparent transactions to the internet. Not just payments, but votes, contract exchanges and more. Without doubt, these are ideas for the future. The consumer impact of the blockchain in 2016 is negligible; the user experience is uncertain and regulation is unformed. However, institutions and investors are heavily committed. In 2015, 42 of the

world's leading banks joined a project applying distributed ledger technologies to global financial markets. Meanwhile, an ecosystem is emerging, with companies like Ethereum, Eris Industries and Ripple Labs building blockchain-like platforms.

1.2.9 Virtual Currencies

Interest is again building in virtual currencies thanks largely to the emergence of the blockchain and the smartphone. Bitcoin was built on top of the blockchain's distributed ledger, where there are no third parties mediating between buyer and seller. Transactions are instant, pseudonymous and accepted anywhere in the world.

Bitcoin, however, is still outside the mainstream. Some countries have banned or prohibited it and its price volatility makes merchants and consumers nervous. So it is unlikely this purely virtual currency will go mass market. That said, there is scope for community and brand-based virtual currencies to flourish, thanks to smartphones and APIs. These virtual currencies are funded by regular fiat currencies, but exist in their own closed networks. Starbucks' payment system is a good example. It is possible to imagine a future wherein Starbucks points could pay for goods outside Starbucks.

1.2.10 Payment of Things

Imagine smart meters that can optimise usage and then pay for what is consumed. This is ultimate promise of the IoT (Internet of Things). Tech and financial services firms are already investigating these ideas. MasterCard, for example, launched a scheme to explore how any accessory, wearable or device can be payment-enabled and quickly scaled for millions of account holders.

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Such audacious ideas are a long way off. The IoT is not established; most people do not have smart homes, or even know why they should want them. Turning 'dumb' devices into smart payment instruments is highly complicated, involving issues such as dispute resolution, theft and hacking. Moreover, the IoT will comprise billions of different appliances with different levels of power consumption and connection bandwidth. They must all 'speak' to each other but, at present, no clear single standard exists.

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