

E-Commerce Assign1

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by Henry Cobbold

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“E-Commerce Business Model”

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Abstract—The aim of this paper is to discuss the e-commerce strategies and systems of a rail engineering firm and how, despite the highly competitive nature of their industry, they can gain new customers. By studying their e-commerce relationships with customers and suppliers the bidding for future contracts is influenced and the relative success is explored.

E-Commerce, Harsco Rail, Engineering, IT, Business Models, Internationalisation, Digital Railway

I. INTRODUCING THE BUSINESS

The business subject to an e-commerce analysis in this report is the ‘Business-to-Business’ (B2B) rail engineering firm *Harsco Rail* [1]. They provide rail vehicles, industry leading consultancy expertise, training programs and an array of mechanical parts to large, sometimes national, railway engineering companies, such as Network Rail in the UK. From Network Rail’s perspective, it is crucial they are supported by specialist firms that can provide materials and market leading understanding in a wide range of niche departments from signalling equipment to staff training programs that can help to provide timely progress on a range of high profile projects.

Despite their high profile and client base, the company’s highly complex and technical e-commerce platform could be improved and by exploring an array of business indicators and other frameworks appropriate adjustments could be made to enhance its suitability [2],[3] and scope [4].

II. SWOT ANALYSIS AND CUSTOMER BASE

A. Strengths

Harsco Rail are one of the biggest players in their specialist field. Unlike many other rail engineering firms *Harsco Rail* have a clear focus on managing the track itself [5]–[10]. In contrast other firms specialise in areas from lineside equipment, such as telecoms or signalling related equipment and installation [11], to extensive vehicle engineering services [12]–[14]. A competitive edge is achieved with their value [15] proposition and clearly relies on high quality services and a large product catalogue [16]. As such their e-commerce platform is sizeable and contains products ranging from new rail vehicles to individual spare components [2].

B. Weaknesses

Despite a suitable B2B web presence with a variety of information about the business, its work and its affiliates the e-commerce aspect of the site is relatively poor and could be enhanced.

Despite specialising in aspects of engineering and IT services there is some degree of overlap and competition in the track services sector [11]. Direct competitors could be Carillion Rail [17],[18] and the rail division of building firm Balfour Beatty [19].

C. Opportunities

The chance to gain new contracts and the continuous technical advancement currently being experienced might both bring up new opportunities. Alongside Crossrail (*see section IV. A*)) there have recently been, and currently are, several large profile development projects such as the reopening of the borders railwaymen Edinburgh and Tweedbank [20],[21] in progress.

The shifting nature of competition is expected to influence Harsco [15]. They may feel that as these businesses are similar they are well placed to gain their work and extend their operations should businesses collapse or go under [17],[18]. Carillion handle some similar aspects of work to Harsco, so taking over their work should be considered.

An “industry-backed proposal to digital modernise train signalling, command, and control systems over 25 years”, titled the “Digital Railway” [22],[23] is driving the development of new systems. This is a big step in technologies used “to solve critical capacity and performance challenges on the railway in the coming years” [24]. “European Rail Traffic Management Systems” (ERTMS) in-cab signalling [23],[25]–[27], currently being trailed in Hertfordshire and used expansively across the continent, is designed to increase capacity and is one aspect of this long term program of technological development. This IT based project directly influences the track and its hardware.

D. Threats

A range of environmental factors (*see section IV. A*)) could be detrimental. One of the biggest, and something that a range of rail tech firms are facing, is the move in the UK towards Network Rail’s “Digital Railway” [22],[23] (*as discussed in*

section II. C)). This could bring increased competition from IT firms that could encroach on businesses [15] that take the more common mechanical approach to engineering projects. New technologies could revolutionise the way track is laid and maintained with new, or existing companies better placed to take advantage of new operating standards or practises – resulting in the failure to secure contracts as they come up for re-tender [28].

E. Customer Base Analysis

There are several different types of customer that might be looking to make purchases through the e-commerce system: [15],[29]

- 'In the field' experts can require spares in a very short timeframe. This type of customer will not necessarily want vast amounts of product information and is feasibly looking to select the desired products and checkout with as little fuss and with as much ease as possible. The focus here is on speed.
- The process of purchasing in some businesses is down to office-based staff [29]. They do not always have the technical product knowledge and may be required to cross check products and so for them a little more information is sometimes beneficial.
- The site must also be able to provide the appropriate information for those simply browsing. Like the other two user groups the site must be easy to navigate [30]. *A range of suggests as to site improvements are in section IV.*

III. STUDYING THE EXISTING SITE

A. Phases of B2B E-Commerce Purchases:

Loranger, Nodder and Neilson [31] propose 6 key elements of e-commerce transaction. These stages are expected to influence both the configuration and content of the Harsco Rail website and E-Commerce presence.

1) Research

Companies looking for contract, training and hardware services will commonly look at a range of firms to view the products and/or services offered and crucially the price ranges on offer [31]. Potential customers will be spec'ing around to narrow down the best options on the market [15] and as such **Fig. 1.** shows Harsco highlighting their services and products across their main front pages [9],[31]. Although price is a key consideration the client may looking for other attributes, such as timescales or support on offer [15],[32]. This is a key stage for employees tasked with sourcing materials that have a limited knowledge on the product they wish to purchase. Extensive research gives a business a greater understanding of the products currently on the market [31].

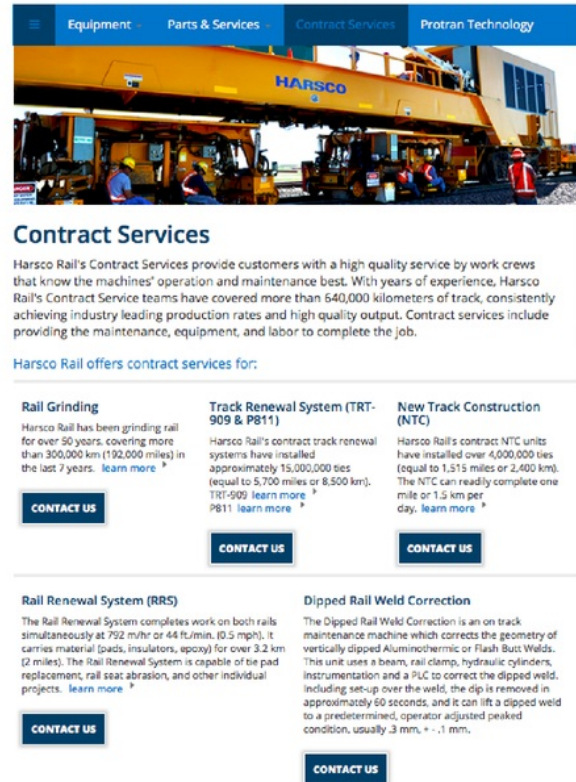


Fig. 1: Services are a key aspect of Harsco's site [9]

2) Relationship

Companies will be refining their original search and shortlist by contacting the business and attempting to get answers to specific questions in relation to the products and/or services that are tempting the purchaser. It gives the prospective client an opportunity to communicate with the business to find out a little more about them as a business too [31]. As shown in **Fig. 2** (and **Fig. 1**) Harsco provide a range of contact details to facilitate discussion(s) [33].

Please contact Harsco Rail with any questions. Upon submitting the form below, your inquiry respond as soon as possible.

*First Name

*Last Name

Company

Title

Phone

*Email

Comment is about?

Other

Comments

Enter the code



Fig 2: Contact for quote or product and/or services information

3) Decide

Large quantities of tender paperwork are commonly developed outlining the reasons behind opening negotiations with a prospective business [31],[29]. The process of narrowing the companies and products, to make the final decision is often based on procedures and processes that occur behind the scenes and not on a website or e-commerce system [15],[34]. When contracts are complete B2B businesses commonly publish contracts won or collaborations formulated (see Fig. 3.), unusually however comparison tables are not included in the website design [31],[34].

News

HARSCO'S RAIL DIVISION CAPTURES NEW RAIL GRINDER SALES IN NORTH AMERICA

CAMP HILL, PA (December 1, 2016) ... Harsco Corporation's railway track maintenance division, Harsco Rail, announced today new sales of its railway track grinders for service in contract rail grinding programs throughout North America. The sales to RailWorks Corporation, one of North America's leading track and transit construction and maintenance service businesses, mark Harsco's successful return to the North American contract grinding sector, where Harsco rail grinding machines have long been a major player in improving track conditions and enhancing safety. Regular rail grinding reprofiles railhead contours for extended rail life and smoother travel, thus reducing fuel consumption, operating costs and noise, while also correcting surface damage that could lead to rail fractures.

RailWorks already has two of the Harsco grinders in active service, with a third unit most recently entering service in November. The sale of a potential fourth unit is anticipated within the first half of 2017. Once concluded, the sales are projected to have a combined value approaching \$20 million. These latest configurations include Harsco's Jupiter II Control System; a laser profile measurement system that provides accurate and reliable measurement of rail profiles in real time; and other features such as onboard dust collection and fire suppression, and an ergonomically designed operator cabin equipped to minimize external vibrations and noise.

"Our winwin relationship with RailWorks in deploying these machines throughout North America addresses a key strategic objective for our business," said Jeswant Gill, Harsco Rail President. "We could not be more pleased to mark our return to this sector than by joining forces with one of the most trusted names in the contract services industry."

Harsco Rail is a global market leader for railway track maintenance and construction, with a broad range of high quality equipment, cuttingedge technology, and worldwide support to major railroads worldwide. To learn more, visit www.harscorail.com.

Fig 3: Harsco's 'Media Centre' showing the status of contracts

4) Buy

Fig. 4. The process of completing the purchase of products or service contract having completed the decision process [31],[29]. It would be inappropriate for Harsco to continually update contract and product negotiations as they are in progress, but on completion this is commonly published material (see Fig. 3). Network Rail publically released details of contracts awarded [28],[35],[36]. For businesses to procure spare parts the simple e-commerce platform can be part of the contractual agreement stating the use of the approved spares.

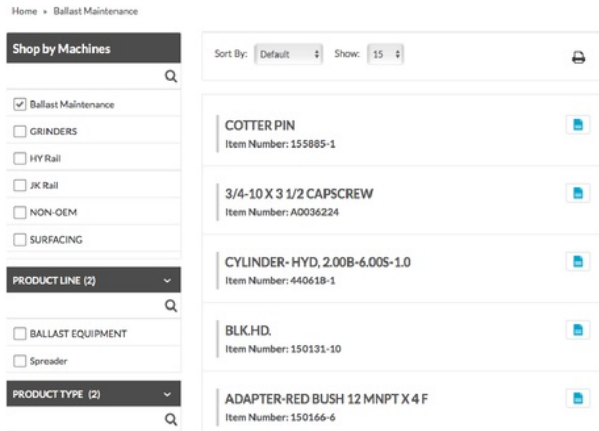


Fig 4: E-Commerce aspect for machinery spares

5) Support and Maintenance

Fig. 5. This is a huge part of Harsco Rail's business model. Companies working with Harsco use their rail equipment and are tied to some degree to the spares bank for the entirety of the contract lifespan [31]. To mutually strengthen the commerce of faculties, the development of interdependencies in a contract, as deployed by Harsco, is common [37]. To inform the prospective companies of the support contact information again is provided to provide the peace of mind that B2B businesses seek [4],[30],[31].

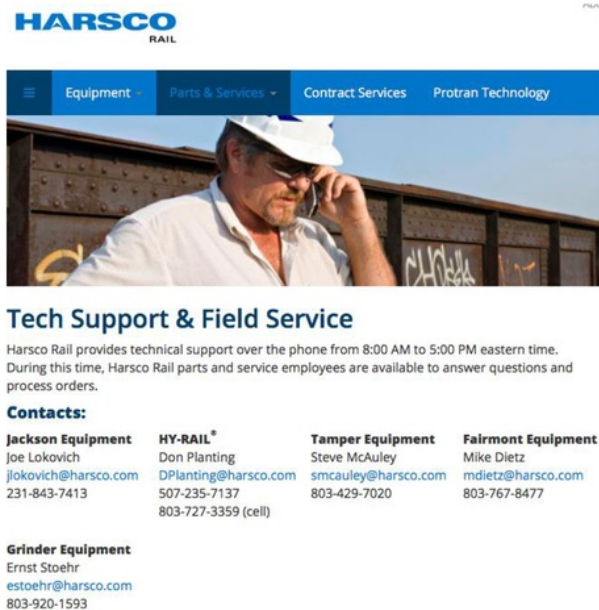


Fig 5: Support available for a range of products

6) Replace

At this stage the process begins again, either when an existing contract ends, or equipment reaches the end of its operable lifespan [32]. It could be this is the same business currently under contract, but in some scenarios will change [31],[32]. Again, this process is not displayed on the Harsco Rail website thus keeping expiring contracts and negotiations private.

B. User Requirements

There are several pieces of information users will be looking for from the Harsco Rail e-commerce platform.

- Comprehensive product information: Users want to quickly identify what Harsco Rail are providing [16],[34] in order to efficiently disregard businesses that do not provide the desired services. Information about the business is useful here too [1].
- Several contact details for each service and/or product: As discussed in section III. A) point 2 and point 3. The presence of contact details significantly aids the communication process once candidates have been shortlisted [31].
- A location to order the spares for machinery as required: The primary use for the e-commerce aspect of the Harsco website is to provide spares for their machinery [2]. See section VI. for suggested improvements to the existing platform.
- Product support: Harsco provide a range of user manuals for their track machines and equipment. This aims to reduce the number of callouts by helping solve smaller issues customers might experience [38].

IV. DISCUSSING E-COMMERCE MODELS

A. Environmental Factors

Investment in the railways is growing. 2016-17 saw 43km more electrified line, mainly due to two work on the Great Western Main Line and '£14.8bn' [39] Crossrail project, the latter the biggest project of its type anywhere across Europe [40],[41]. A large proportion of contracts awarded were to companies based in the UK, but track foundation and laying contracts were awarded to an alliance between 'Costain, TSO and Alstom' [42]–[44] with Harsco Rail missing out on a huge opportunity for work [41].

Brexit and the vote to leave the European Union (EU) is likely to influence businesses in the rail sector [45][46]. Before the Brexit vote in 2011 the then Transport Secretary Phillip Hammond suggested "investment, particularly in transport infrastructure, to allow the potential of our northern cities to be realised is a crucial contribution to the overall prosperity of the economy going forward, and I believe that those big infrastructure projects are going to be key to Britain's future" [45], something that will now have added scrutiny beyond the March 29th 2019 and officially leaving the EU [46].

- Investing in high speed routes: [45] Plans for a second high speed rail route from London to Birmingham, 'High Speed 2' (HS2) could be influenced by Brexit [29]. The nature of huge

contract opportunities for construction firms post-Brexit could now look very different [46]. The controversial new route, expected to cost in excess of £55 million, has been publically backed by government throughout 2017 [46].

- *'Northern Hub/Powerhouse'*: Alongside large projects such as HS2, investment in the north of England is key transport links will see big development [47]. The improvements will see existing lines upgraded and new interchanges created to further connect big cities, such as Leeds and Sheffield. The project is estimated to improve the transport for approximately 1.3 million people [45],[48]. Like that of HS2 this would be a large series of contracts for Harsco to secure.
- *Legislative power*: Much of the current railway operation and infrastructure legislation [29] is currently imposed by the EU [49], such as emission regulations [50] and during late 2017 a revised 9-digit vehicle numbering system [51]. With the complete power back held by the UK government appropriate changes to the network [52] can now be discussed to increase the possibilities for engineering firms such as Harsco [49].

B. Key Elements

Value Proposition: Harsco are one of a select view big names in this area. But, like several direct competitors, have a global presence here in the UK and North America. Harsco present their value in a several ways: [16],[32]

- 1) Industry leading rail vehicles and access to comprehensive accredited spare parts [2].
- 2) Complete contract services [9]
- 3) Professional grade training expertise [10]

Revenue Model: [15] By providing contracts a high-profile subscription-based model is developed, mainly behind the scenes with the contracts won mainly publicised through the news section of the website and the railway press. Harsco Rail fall into this category. The spares float provides the direct sales model.

Market Opportunity: [15],[53] Some massive new contracts are to be awarded in the relatively near future that Harsco could well be bidding for. Opportunity too has arisen from the collapse of a direct rival [17],[18] and the prospect of gaining more work.

Competitive Environment: [15], [16] There are numerous rail engineering firms, so the opportunity for new competition is relatively limited. However, with companies often specialising in certain fields, the opportunity to grow in a department is possible. One of Harsco Rail's biggest competitors, Carillion Rail, has recently dropped into administration [17],[18] and this leaves a gap in the market for existing firms to fill or for new companies to move into for contracts. This commonly relates directly to the market opportunity [53].

Competitive Advantage: [15], [16] More than just the supply of products, Harsco provide training services, and in some

cases all the elements needed to complete a job. With the folding of a direct competitor their advantage in the contract and expertise has added weight [17],[18].

Market Strategy: Harsco's 'Media Centre' covers "press releases, application stories, product videos and customer newsletters" [54] and their contracts are often publicised in the railway press. Their main direct marketing streams are their website [1] and social media channels [55] (see section V. B)) and due to the sensitive nature of contract discussions work obtained is often published after it has been completely finalised. The nature of contracts signed too is fluid and, as outlined during section II., partially down to the state of the sector at any given instance [53].

Organisational Development: Despite a lack of clear structural information several *assumptions* can be made for a business in this sector with departments for the following key aspects of the Harsco Rail business

- Specialists for each type of engineering equipment
- Bespoke services coordinators
- E-commerce dept. that manages the product sales on their website
- Contract dept. to facilitate discussion with Harsco customers
- Contract dept. to facilitate discussion with their accredited spares suppliers
- Dept. to formulate and manage contract bids
- Marketing Dept. which manages promotional material

Management Team: As a company Harsco Corporation have three main areas of work; 'Metals and Minerals' [56], 'Industrial' [57] (itself with three sub-divisions) and then the rail subsidiary [1]. It could be assumed that for each division a tall organisational structure sees most of the power with both country and department specific directors and executives. Implementing this could give the company a highly reputable and regulated working environment.

V. RECOMMENDING SUITABLE E-MARKING AND E-PROCUREMENT PROCESSES

A. E-Procurement

B2B businesses that offer a range of products are likely to work in cooperation with an 'E-Distributor' [58]. This procurement configuration can be seen in *Fig. 6* and acts, in the scenario of Harsco Rail, as an intermediary between the manufacturers of the products and the seller(s) Harsco Rail and/or similar firms [58]. The balance of power between the manufacturers and the purchaser (Harsco) is in manufacturers, as it is likely they will be supplying a range of industries as it could be assumed that at least the parts manufacturers are quite generic [34].

Assumptions can be made as to the relative stability with the supplier [29] connections potentially dependent on the number of contracts Harsco are themselves supplying materials to [59].

It is assumed for the purposes of this diagram that the large quantities of spares are manufactured elsewhere to the complete

vehicles. In practise contracts are subject to operational circumstance.

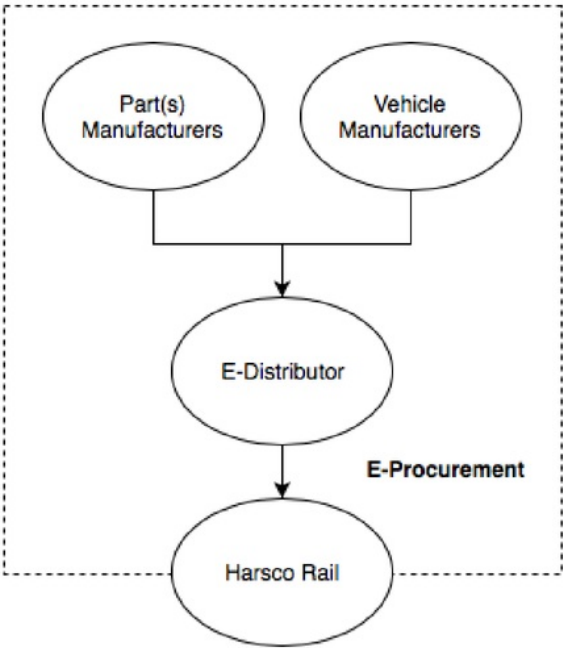


Fig 6: E-Distributors in the E-Procurement process

B. E-Marketing and Internationalisation opportunities

Harsco use a mixture of traditional and non-traditional marketing strategies [60],[29]. Their website has mainly traditional methods, with news stories added to a media page and published newsletter. To compliment this mainly non-interactive communication Harsco’s social media platforms [29],[55],[61] are key for push-pull marketing to engage potential clients and educate visitors new to the business [61].

However (as Fig. 7, 8, and 9. show) [55] the business sector and its sales techniques influence marketing [29] as the social media therefor may focus less on advertising tangible products, but more on the dynamic range of industry leading services that Harsco can provide for any track engineering scenario. Source [55] does still promote new rail vehicles that are currently coming on stream, such as new tamping equipment.

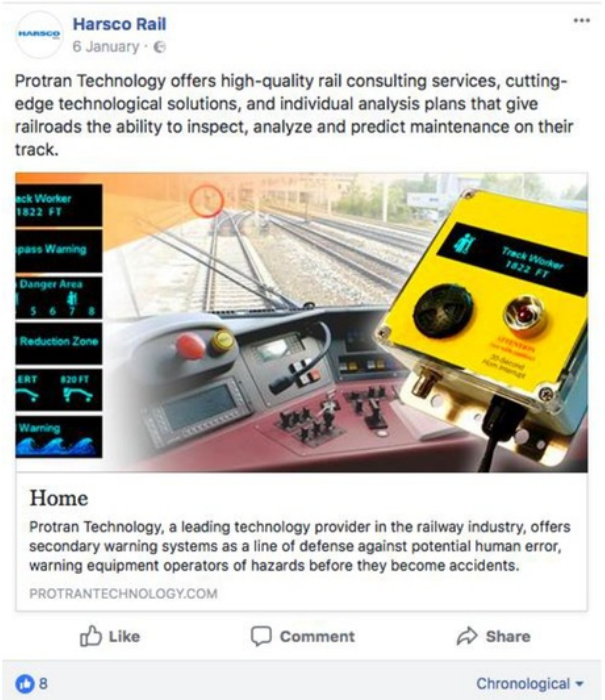


Fig. 7: Outlining Protran [55]

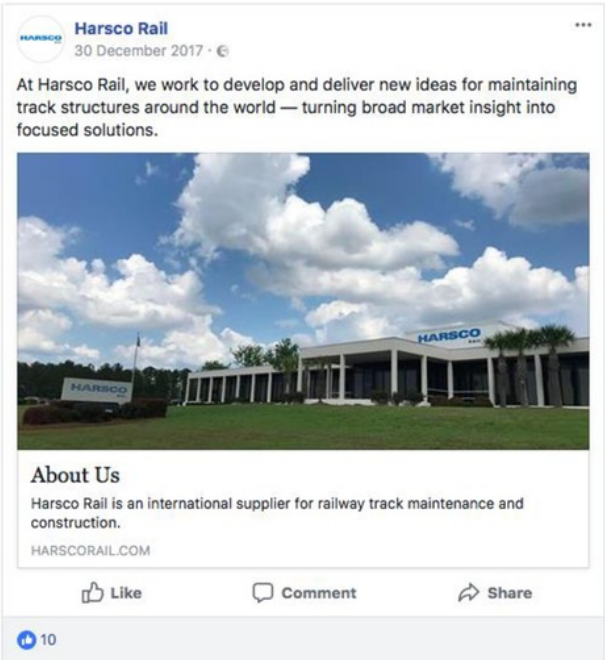


Fig. 8: About Us [55]

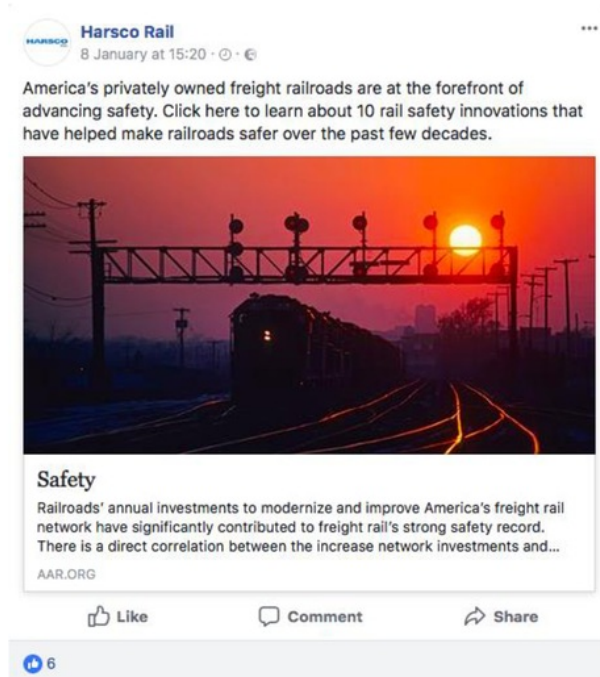


Fig. 9: Promoting appropriate new safety innovations [55]

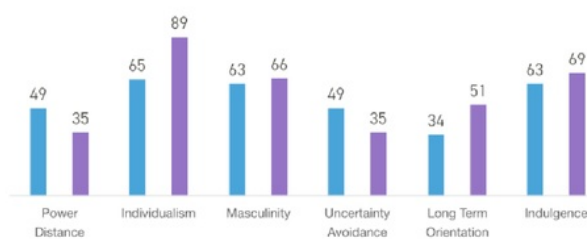


Fig. 10: Comparing South Africa (blue) against the UK (purple) [62]

Fig. 10. represents 'Hofstede's dimensions of culture' factors [63], for the UK and South Africa [62].

Harsco Rail already operate on a global scale [29], namely in the UK and continental Europe, North America, South America, Asia and Australasia [64]. Africa is one continent Harsco currently have no operations with South Africa a suitable country given its relative financial stability and reasonable rail network.

For Harsco to successfully adapt to this new location, as the graphic above shows, the big consideration is 'Individualism/Collectivism' [62],[63]. The UK, here in blue is far more towards the individualistic end of the scale, suggesting we are more interested in providing for ourselves as individuals rather than those that are close to us [63],[65].

South Africa, although still closer to individualism, do put significantly more emphasises on a collective mind-set [63]. To outline Harsco's goals (their respective targets) and vision the 'Vision Elements' section of the 'About' website page [1], with the exception of the Chinese site version, describes its businesses as one focused on its industry partners and customers.

"Anticipate customers' needs and satisfy expectations through first rate service, product quality and on-time delivery" [1]

The top of the same page also describes the business as;

"a global diversified industrial company" [1]

By diversifying into South Africa Harsco would have to put added emphasises on their products and their collective benefit for society as a whole [63], namely safety and durability, something they already have tied into their business vision.

VI. IMPLEMENTATION ISSUES AND SUMMARY

Given the rise of voice assistant interfaces [66],[67], the following section explores the validity of products in this B2B context to provide Harsco Rail an alternative e-commerce approach [68]. Despite the huge rise in popularity of such systems there are several reasons to be wary.

Given that complexity is a common attribute of B2B sites [34] and many third-party applications [68] voice assistants would therefore have to participate in complex voice communication. Both main services that Harsco provide are not suited to this as they either reliant on correct translation of technical product names, numbers and customer order or payment details [60] in the case of the e-commerce spares listings, or in the case of the contract services, the need to spend a long time in conversation.

Unsuitable environment. It can be assumed for businesses such as Harsco that operate in the field emergency spare parts will be needed in a short timeframe. By publishing a contact mobile number for each range of products (see Fig. 5) contact is easy. Using an Amazon Echo in the field is inappropriate given typical working conditions of the employees using the product [4].

The single significant change to the existing solution is the format with which products are listed. It currently presents users with issues of navigation and accessing product information [60].

Re-designing the site presents a range of benefits;

- Ease of use: [60],[69] Can the user access the information that they want? A catalogue format will naturally bring structure to the products so that they are all grouped justifiably. Searching too is significantly improved on the current solution negating the need for awkward filters or a vague 'search' box. By removing the large product

catalogue from the website, it becomes far more streamlined and easier itself to navigate.

- Easier to update: [70],[69] Product changes can be reflected in new versions of the catalogue. However, archived catalogues could be kept on the website for added clarity.
- Tailored for m-commerce: [69],[71],[72] Being easily accessible on mobile devices in .pdf format the digital catalogue lends itself to mobile commerce. It abolishes the need for detailed fields and filters and can easily be viewed on a tablet or smartphone device.

Such is the focus on railway development, talk of 'Crossrail 2' [73],[74] has already begun, despite the fact Crossrail itself is not expected to be fully complete before late 2018. A show that the engineering firms on Britain's railways will be competing for dynamic, revolutionary projects well into the future...

VII. REFERENCES AND CITED WORK(S)

- [1] Harsco Rail, "Harsco Rail - About Us," *webpage*, 2016. [Online]. Available: <http://www.harscorail.com/about-us.html>. [Accessed: 15-Jan-2018].
- [2] Harsco Rail, "Harsco Ecommerce," *webpage*, 2018. [Online]. Available: <https://parts.harscorail.com/>. [Accessed: 15-Jan-2018].
- [3] Harsco Rail, "Harsco Ecommerce - Ballast Maintenance Parts List," *webpage*, 2018. [Online]. Available: <https://parts.harscorail.com/index.php?route=product/category&path=2&ptype=2&back=yes>. [Accessed: 15-Jan-2018].
- [4] A. A. Abdelkarim and H. H. O. Nasereddin, "MOBILE COMMERCE," *J. Math. Technol.*, no. 4, pp. 2078–257, 2010.
- [5] Harsco Rail, "Harsco Rail - Surfacing and Tamping Equipment," *webpage*, 2016. [Online]. Available: <http://www.harscorail.com/equipment/surfacing.html>. [Accessed: 15-Jan-2018].
- [6] Harsco Rail, "Harsco Rail - Grinding Equipment," *webpage*, 2016. [Online]. Available: <http://www.harscorail.com/equipment/grinders.html>. [Accessed: 15-Jan-2018].
- [7] Harsco Rail, "Harsco Rail - Ballast Maintenance," *webpage*, 2016. [Online]. Available: <http://www.harscorail.com/equipment/ballast-maintenance.html>. [Accessed: 15-Jan-2018].
- [8] Harsco Rail, "Harsco Rail - Track Construction and Renewal," *webpage*, 2016. [Online]. Available: <http://www.harscorail.com/equipment/track-construction-and-renewal.html>. [Accessed: 15-Jan-2018].
- [9] Harsco Rail, "Harsco Rail - Contract Services," *webpage*, 2016. [Online]. Available: <http://www.harscorail.com/contract-services.html>. [Accessed: 15-Jan-2018].
- [10] Harsco Rail, "Harsco Rail - On-Site Training," *webpage*, 2016. [Online]. Available: <http://www.harscorail.com/parts-services/on-site-training.html>. [Accessed: 15-Jan-2018].
- [11] Network Rail, "Supply of works, services or products – Network Rail," *webpage*, 2017. [Online]. Available: <https://www.networkrail.co.uk/industry-commercial-partners/supplying-us/supply-works-services-products/>. [Accessed: 17-Jan-2018].
- [12] Anonymous, "Siemens Mobility wins telecomms infrastructure contract," Coventry, 2009.
- [13] Anonymous, "Loram Maintenance of Way Acquires 51% Stake in Railway Vehicle Engineering (RVEL)," London, 2014.
- [14] Anonymous, "Acquisition of RVEL completed by Loram," London, 2016.
- [15] A. Lui, M. Leach, and R. Chugh, "A sales process framework to regain B2B customers," *J. Bus. Ind. Mark.*, vol. 30, no. 8, pp. 906–914, 2015.
- [16] J. B. Pine, "How B2B companies create economic value by designing experiences and transformations for their customers," *Strateg. Leadersh.*, vol. 43, no. 3, pp. 2–6, 2015.
- [17] H. Derrick, "Carillion Collapse: What To Know About Its Liquidation," *Fortune.com*, 2018. [Online]. Available: <http://fortune.com/2018/01/15/what-you-need-to-know-about-the-collapse-of-carillion-a-u-k-construction-giant/>. [Accessed: 13-Feb-2018].
- [18] Anonymous, "Britain's hard bargains; Carillion's collapse," *Econ.*, vol. 426, no. 9075, p. 12, 2018.
- [19] Balfour Beatty Rail, "Track geometry services," *webpage*, 2018. [Online]. Available: <https://www.balfourbeatty.com/expertise/rail-engineering/rail-plant/track-geometry-services/>. [Accessed: 07-Feb-2018].
- [20] Anonymous, "The Borders Railway," *A to B*, no. 111, pp. 21–29, 2016.
- [21] Anonymous, "No end date for £3bn GWML electrification," *Rail Bus. Intell.*, no. 497, pp. 1–7, 2015.
- [22] Digital Railway, "Digital Railway - Suppliers," *webpage*. [Online]. Available: <http://digitalrailway.co.uk/suppliers/>. [Accessed: 30-Jan-2018].
- [23] C. Kessell, "The Digital Railway – A supplier's view," *webpage*, 2017. [Online]. Available: <https://www.railengineer.uk/2017/02/24/the-digital-railway-a-suppliers-view/>. [Accessed: 31-Jan-2018].
- [24] D. Waboso CBE and G. Wakeford, "Delivering Digital Train Control Technology Efficiently," London, 2016.
- [25] C. Kessell, "ERTMS UK test site," *webpage*, 2014. [Online]. Available: <https://www.railengineer.uk/2014/07/09/ertms-uk-test-site/>. [Accessed: 29-Jan-2018].
- [26] K. Strang, "ERTMS drives change in the signalling market," *Railw. Gaz. Int.*, vol. 161, no. 11, p. 682,

- 2005.
- [27] Rail Safety Standards Board (RSSB), "ERTMS," *webpage*, 2018. [Online]. Available: <https://www.rssb.co.uk/improving-industry-performance/ertms>. [Accessed: 31-Jan-2018].
- [28] Network Rail, "Tender opportunities – Network Rail," *webpage*, 2017. [Online]. Available: <https://www.networkrail.co.uk/industry-commercial-partners/supplying-us/tender-opportunities/>. [Accessed: 19-Jan-2018].
- [29] J. Blythe, *Essentials of Marketing*, 5th ed. Harlow: Pearson, 2012.
- [30] R. Wollan, "B2B Customers Want a Good Experience, Too," *Cust. Relatsh. Manag.*, vol. 20, no. 1, p. 8, 2016.
- [31] B. H. Loranger, C. Nodder, and J. Nielsen, *B2B Website Usability: Leads and Customers*, no. June. Fremont, CA: Neilson Norman Group, 2006.
- [32] K. Chen, Y.-H. Hu, and Y.-C. Hsieh, "Predicting customer churn using from valuable B2B customers in the logistics industry: a case study," *Inf. Syst. E-bus. Manag.*, vol. 13, no. 3, pp. 475–494, 2014.
- [33] Harsco Rail, "Harsco Rail - Contact," *webpage*, 2018. [Online]. Available: <http://www.hascorail.com/contact.html>. [Accessed: 05-Feb-2018].
- [34] P. Laubheimer, "B2B vs. B2C Websites: Key UX Differences," *webpage*, 2016. [Online]. Available: <https://www.nngroup.com/articles/b2b-vs-b2c/>. [Accessed: 08-Feb-2018].
- [35] Railway Gazette, "Network Rail orders Harsco Stoneblowers," *webpage*, 2017. [Online]. Available: <http://www.railwaygazette.com/news/infrastructure/singgle-view/view/network-rail-orders-harsco-stoneblowers.html>. [Accessed: 15-Jan-2018].
- [36] Harsco Rail, "Harsco Rail Awarded Multi-Year Contract for UK Rail Grinding Services," *webpage*, 2016. [Online]. Available: <http://www.hascorail.com/news/138-harsco-s-rail-business-awarded-multiyear-contract-for-uk-rail-grinding-services.html>. [Accessed: 15-Jan-2018].
- [37] S. C. Lee, B. Y. Pak, and H. G. Lee, "Business value of B2B electronic commerce: the critical role of inter-firm collaboration," *Electron. Commer. Res. Appl.*, vol. 2, pp. 350–361, 2003.
- [38] Harsco Rail, "Harsco Rail - Heavy Duty Equipment," *webpage*, 2018. [Online]. Available: <http://www.hascorail.com/equipment/hy-rail/manuals/heavy-duty.html>. [Accessed: 08-Feb-2018].
- [39] K. Smith, "Tracklaying complete on London's Crossrail project," *webpage*, 2017. [Online]. Available: <http://www.railjournal.com/index.php/track/track-laying-complete-on-londons-crossrail-project.html?channel=000>. [Accessed: 31-Jan-2018].
- [40] Office of Road and Rail (ORR), "Rail infrastructure, assets and environmental 2016-17 Annual Statistical Release," 2017.
- [41] Anonymous, "The interview: Crossrail and its partners have outperformed themselves and achieved some great things," *Logist. Transp. Focus*, vol. 19, no. 10, pp. 21–23, 2017.
- [42] Costain, "Costain Rail," *webpage*, 2015. [Online]. Available: <http://www.costain.com/what-we-do/rail/>. [Accessed: 08-Feb-2018].
- [43] TSO.fr, "TSO Railways," *webpage*. [Online]. Available: <http://www.tso.fr/tso-construction-renouvellement-voies-ferroviaires.asp?LANGUE=GB>. [Accessed: 08-Feb-2018].
- [44] Alstom, "Alstom - Track Laying," *webpage*, 2017. [Online]. Available: <http://www.alstom.com/products-services/product-catalogue/rail-systems/Infrastructures/products/tracklaying/>. [Accessed: 08-Feb-2018].
- [45] Addleshaw Goddard, "What impact could Brexit have on the UK railway industry?," *webpage*, 2016. [Online]. Available: <https://www.addleshawgoddard.com/en/insights/insights-briefings/brexit-insights/what-impact-could-brexit-have-on-the-uk-railway-industry/>. [Accessed: 08-Feb-2018].
- [46] L. Butcher, "Brexit : how will it affect transport?," *House Commons Libr.*, no. Briefing Paper No CBP7633, p. 57, 2016.
- [47] A. Nurse, C.-L. Chen, and X. Desjardins, "The Northern Powerhouse: a comparative perspective," *T. Planning Rev.*, vol. 88, no. 4, pp. 383–400, 27AD.
- [48] Transport for the North, "Northern Powerhouse Rail," *webpage*, 2018. [Online]. Available: <https://transportforthenorth.com/northern-powerhouse-rail/>. [Accessed: 08-Feb-2018].
- [49] T. Samuel and R. Shepherd, "UK: Brexit - What should the Railway industry be doing now?," *Mondaq*, 2018. [Online]. Available: <http://www.mondaq.com/uk/x/660894/cycling+rail+road/Brexit+What+Should+The+Railway+Industry+Be+Doing+Now>. [Accessed: 09-Feb-2018].
- [50] Rail Safety Standards Board (RSSB), "Air and Health Impacts of Diesel Emissions," 2016.
- [51] Rail Safety Standards Board (RSSB), "Rail Vehicle Numbering Explained," *webpage*, 2018. [Online]. Available: <https://www.rssb.co.uk/Pages/improving-industry-performance/rail-vehicle-numbering-explained.aspx>. [Accessed: 08-Feb-2018].
- [52] Rail Standards Safety Board (RSSB), "Brexit: The future for standards," *webpage*, 2018. [Online]. Available: <https://www.rssb.co.uk/standards-and-the-rail-industry/standards-explained/our-strategy/brexit-the-future-for-standards>. [Accessed: 12-Feb-2018].
- [53] F. Wiersema, "The B2B Agenda: The current state of B2B marketing and a look ahead," *Ind. Mark. Manag.*, vol. 42, no. 4, pp. 470–488, 2013.
- [54] Harsco Rail, "Harsco Rail - Media Center," *webpage*, 2018. [Online]. Available:

- <http://www.harscorail.com/media-center.html>. [Accessed: 12-Feb-2018].
- [55] Harsco Rail, "Facebook - Harsco Rail," *Facebook*, 2018. [Online]. Available: <https://www.facebook.com/HarscoRail/>. [Accessed: 10-Feb-2018].
- [56] Harsco Corp., "Harsco: Contact - Our Divisions - Metals," *webpage*, 2018. [Online]. Available: <https://www.harsco.com/metalsminerals/>. [Accessed: 12-Feb-2018].
- [57] Harsco Corp., "Harsco: Contact - Our Divisions - Industrial," *webpage*, 2018. [Online]. Available: <https://www.harsco.com/industrial/>. [Accessed: 12-Feb-2018].
- [58] K. C. Laudon and C. G. Traver, *E-Commerce 2013*, 9th ed. Harlow: Pearson, 2013.
- [59] H. H. Chang, Y.-C. Tsai, and C.-H. Hsu, "E-procurement and supply chain performance," *Supply Chain Manag.*, vol. 18, no. 1, pp. 34–51, 2013.
- [60] Anonymous, "B2B Marketing in the Digital Age," *Teach. Bus. Econ.*, vol. 20, no. 2, pp. 6–9, 2016.
- [61] E. Brown, *Working the Crowd: Social Media Marketing for Business*, 2nd ed. London: British Computer Society, 2012.
- [62] Hofstede's Insights, "Compare Countries," *webpage*, 2018. [Online]. Available: <https://www.hofstede-insights.com/product/compare-countries/>. [Accessed: 08-Feb-2018].
- [63] G. Hofstede, "Dimensionalizing Cultures: The Hofstede Model in Context," 2009.
- [64] Harsco Rail, "Harsco Rail - Locations," *webpage*, 2016. [Online]. Available: <http://www.harscorail.com/about-us/locations.html>. [Accessed: 15-Jan-2018].
- [65] Hofstede Insights, "National Culture - Hofstede Insights," *webpage*, 2018. [Online]. Available: <https://www.hofstede-insights.com/models/national-culture/>. [Accessed: 12-Feb-2018].
- [66] D. Crookes, "Our guide to Alexa," *Web User*, no. 418, pp. 36–37, 2017.
- [67] Anonymous, "Google Home," *Comput. Act!ve*, no. 501, p. 1, 2017.
- [68] B. Leary, "Companies Must Heed the Voice (Literally) of the Customer," *Cust. Relatsh. Manag.*, vol. 21, no. 7, p. 48, 2017.
- [69] B. P. Sigman and B. J. Boston, "Digital Discernment: An E-Commerce Web Site Evaluation Tool," *Decis. Sci. J. Innov. Educ.*, vol. 11, no. 1, pp. 29–46, 2013.
- [70] J. V. Chen, Y. Chen, and E. P. S. Capistrano, "Process quality and collaboration quality on B2B e-commerce," *Ind. Manag. Data Syst.*, vol. 113, no. 6, pp. 908–926, 2013.
- [71] N. M. Sperdea, M. Enescu, and M. Enescu, "Challenges of Managing E-Commerce," *Econ. Manag. Financ. Times*, vol. 6, no. 2, pp. 194–199, 2011.
- [72] Anonymous, "BBC prepares UK engineering companies for e-commerce explosion," *Anti-corrosion Methods Mater.*, vol. 50, no. 5, p. 385, 2003.
- [73] L. Nation, "London On Track," *L. J.*, no. Jul/Aug, pp. 20–21, 2016.
- [74] Anonymous, "Crossrail 2: London's next 'necessary' rail project," *Progress. Digit. Media Transp. News*, no. Apr, 2016.

VIII. APPENDICES AND ADDITIONAL WORK(S)

A) Introduction to Harsco Presentation slides are included below

“E-Commerce Site, Design and Business Model”

E-Commerce

Lecturer: Saw Maw

UWTSD

Henry Cobbold – P149234

School of Applied Computing

Introducing the E-Commerce Business

HARSCO
RAIL

Insight onsite.™ [1]

- *Harsco Rail* are a rail technology and engineering firm that provide a range of global services: [2],[3]
 1. An array of on-track engineering vehicles including track ‘*Tampers*’, rail ‘*Grinders*’, ballasting equipment and track replacement solutions [4]-[7].
 2. Large parts catalogue for supported products (*see suggested improvements*) [8],[10].
 3. Offer comprehensive contract (and consultancy) and training services [11],[12].
- There are 9 main geographical locations that coordinate products and services [2].

Identifying the E-Commerce Position

- **Strong example of a B2B business model** as they:
 - Work alongside, and provide materials for, larger government financed engineering firms such as Network Rail in the UK [13].
"Harsco Rail's success is due largely to our commitment to work as a partner with customers in solving the unique challenges of maintaining railway track structures" [2].
 - The E-Commerce platform has the following attributes [27].
 - Technical product names
 - Very limited, technical descriptions
- Everyday consumers will not purchase from this site as they offer bespoke and niche services (hence a large part of their work is contract based)

The E-Commerce Platform

[9]

The screenshot displays the Harsco Rail E-commerce platform. The top navigation bar includes 'Home' and 'Ballast Maintenance'. The left sidebar features a 'Shop by Machines' section with a search bar and a list of categories: Ballast Maintenance (checked), GRINDERS, HY Rail, JK Rail, NON-ODM, and SURFACING. Below this are 'PRODUCT LINE (2)' and 'PRODUCT TYPE (2)' sections, each with a search bar and a list of categories: BALLAST EQUIPMENT, Spreader, BALLAST REGULATOR, and Spreader. The 'MODEL (4)' section also has a search bar and a list of categories: BALLAST REGULATOR. The main product list shows items like COTTER PIN, 3/4-10 X 3 1/2 CAPSCREW, CYLINDER-HYD, 2,008-6,005-1.0, BLK.HD., ADAPTER-RED BUSH 12 MNPT X 4 F, DC-ELB90 4X4BH, and CABLE. The right sidebar contains an 'Account' section with links for LOGIN / REGISTER, FORGOT PASSWORD, MY ACCOUNT, and ORDER HISTORY. Below this is a 'CONTACT SALES' section with contact information for Columbia, Ludington, and Fairmont. The bottom section shows a detailed product view for 'CYLINDER-HYD, 2,008-6,005-1.0' with a 'No Picture' placeholder, a description, and a quantity selector.

Home • Ballast Maintenance

Shop by Machines

Sort By: Default Show: 15

Account

LOGIN / REGISTER

FORGOT PASSWORD

MY ACCOUNT

ORDER HISTORY

Home • Ballast Maintenance • CYLINDER-HYD, 2,008-6,005-1.0

Item Code: 40458-1

Availability: **INSTOCK**

Warehouse Location: LUDINGTON, MI

Qty: 1 **ADD TO CART**

DESCRIPTION

Used On Machine: SPREADER

Unit of Measurements: ea

Commodity: Cylinder

CONTACT SALES

Columbia
803-822-7420

Ludington
800-800-6410

Fairmont
507-235-7376

sales@harsco.com

Discussing the Business Model – *Competitive Environment*

- Companies such as Network Rail, that manage railway systems (hardware and software) nationally depend on specialist rail engineering firms alongside their own products and expertise by tendering contracts [29], [30].
- Firms generally specialise in certain areas including: [18]
 - Track and lineside equipment (such as Balfour Beatty Rail) [17].
 - Signaling and Telecoms (such as Siemens) [19],[31].
 - Vehicle engineering and re-engineering specialists (such as Loram Rail) [20],[21].
- **Fig. 1** shows a range of similar businesses works to supply nationally funded agencies or businesses globally. A good example of a **Many Sellers to Many Buyers** model [32].

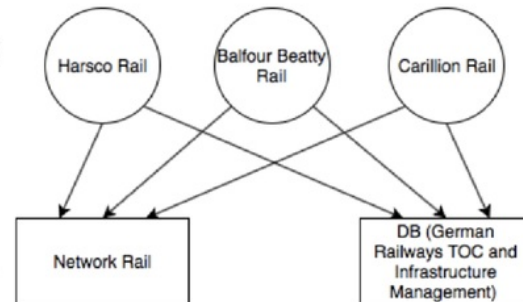


Fig. 1 showing a range of firms working with nationalised engineering firms in the UK and Germany [14],[16],[32]

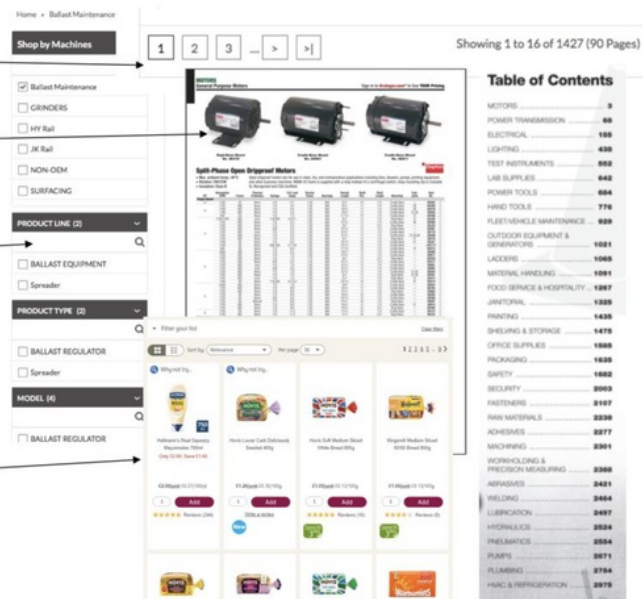
Discussing the Business Model – *Revenue Model(s)*

- Main sales are *likely* to be high profile contracts awarded for engineering projects [13]-[15].
- Bespoke services providing hardware, suitable expertise and work teams [11] as well as just physical products, providing complete solutions for customers [23].
- Machinery require a large spares float, which in turn provides:
 - Continued visits to the e-commerce presence
 - Significantly reduces the number of standalone purchases [22]
 - But, as discussed later, improvements to how this information is presented could be made
- Non-tangible products (such as training services) could promote products, *potentially* increasing revenue through its main channels.
- Harsco Rail therefore could be considered to deploy both the *Subscription Revenue Model (in the form of contracts and consultancy)* and the *Sales Revenue Model (with the large e-commerce spares bank)* [24],[25].

Suggested Site Improvements/Adjustments

- The current format is not suited to a large bank of technical products, some categories have 1000+ items [27].
- Rather than a more B2C oriented platform, a large downloadable catalogue/directory would be preferable because:
 - Suits a large quantity of technical products (and information) [27]
 - Negates the need for intricate on page fields and page after page of products
 - Catalogue changes are easier
 - Being a streamlined platform it could also be distributed in paper form
 - Better suited to mobile e-commerce (or m-commerce) due to a streamlined product view [26]
- Current system is more suited to B2C E-commerce platforms, such as supermarkets.
- Engineering firms and their e-commerce systems as a business have suffered suggest reports due to their digital presence [28].

Screenshots taken from Harsco Rail, Sainsbury's and Grainger E-commerce platforms



References and Cited Work(s)

- [1] "Harsco Rail," webpage. [Online]. Available: <http://www.farmbro.com/wp-content/uploads/2015/04/harsco.jpg>. [Accessed: 11-Jan-2018].
- [2] Harsco Rail, "Harsco Rail - About Us," webpage, 2016. [Online]. Available: <http://www.harscorail.com/about-us.html>. [Accessed: 15-Jan-2018].
- [3] Harsco Rail, "Harsco Rail - Locations," webpage, 2016. [Online]. Available: <http://www.harscorail.com/about-us/locations.html>. [Accessed: 15-Jan-2018].
- [4] Harsco Rail, "Harsco Rail - Grinding Equipment," webpage, 2016. [Online]. Available: <http://www.harscorail.com/equipment/grinders.html>. [Accessed: 15-Jan-2018].
- [5] Harsco Rail, "Harsco Rail - Ballast Maintenance," webpage, 2016. [Online]. Available: <http://www.harscorail.com/equipment/ballast-maintenance.html>. [Accessed: 15-Jan-2018].
- [6] Harsco Rail, "Harsco Rail - Track Construction and Renewal," webpage, 2016. [Online]. Available: <http://www.harscorail.com/equipment/track-construction-and-renewal.html>. [Accessed: 15-Jan-2018].
- [7] Harsco Rail, "Harsco Rail - Surfacing and Tamping Equipment," webpage, 2016. [Online]. Available: <http://www.harscorail.com/equipment/surfacing.html>. [Accessed: 15-Jan-2018].
- [8] Harsco Rail, "Harsco Rail - Parts and Services," webpage, 2016. [Online]. Available: <http://www.harscorail.com/parts-services.html>. [Accessed: 15-Jan-2018].
- [9] Harsco Rail, "Harsco Ecommerce," webpage, 2018. [Online]. Available: <https://parts.harscorail.com/>. [Accessed: 15-Jan-2018].
- [10] Harsco Rail, "Harsco Ecommerce - Ballast Maintenance Parts List," webpage, 2018. [Online]. Available: <https://parts.harscorail.com/index.php?route=product/category&path=2&ptype=2&back=yes>. [Accessed: 15-Jan-2018].
- [11] Harsco Rail, "Harsco Rail - Contract Services," webpage, 2016. [Online]. Available: <http://www.harscorail.com/contract-services.html>. [Accessed: 15-Jan-2018].
- [12] Harsco Rail, "Harsco Rail - On-Site Training," webpage, 2016. [Online]. Available: <http://www.harscorail.com/parts-services/on-site-training.html>. [Accessed: 15-Jan-2018].
- [13] Harsco Rail, "Harsco Rail Awarded Multi-Year Contract for UK Rail Grinding Services," webpage, 2016. [Online]. Available: <http://www.harscorail.com/news/138-harsco-s-rail-business-awarded-multiyear-contract-for-uk-rail-grinding-services.html>. [Accessed: 15-Jan-2018].
- [14] Railway Gazette, "Network Rail orders Harsco Stoneblowers," webpage, 2017. [Online]. Available: <http://www.railwaygazette.com/news/infrastructure/single-view/view/network-rail-orders-harsco-stoneblowers.html>. [Accessed: 15-Jan-2018].
- [15] anonymous, "Harsco Rail delivers updated spreader-ditcher machine," *Railw. Age*, vol. 214, no. 3, pp. 47-47, 2013.
- [16] Anonymous, "Government backs integrated DB," *Railw. Gaz. Int.*, vol. 158, no. 7, p. 413, 2003.

References and Cited Work(s) – Cont.

- [17] Balfour Beatty Rail, "Track geometry services," *webpage*, 2018. [Online]. Available: <https://www.balfourbeatty.com/expertise/rail-engineering/rail-plant/track-geometry-services/>. [Accessed: 18-Jan-2018].
- [18] Kable Intelligence Ltd., "Company A-Z - Railway Technology," *webpage*, 2018. [Online]. Available: <http://www.railway-technology.com/company-a-z/>. [Accessed: 15-Jan-2018].
- [19] Anonymous, "Siemens Mobility wins telecomms infrastructure contract," Coventry, 2009.
- [20] Anonymous, "Acquisition of RVEL completed by Loram," London, 2016.
- [21] Anonymous, "Loram Maintenance of Way Acquires 51% Stake in Railway Vehicle Engineering (RVEL)," London, 2014.
- [22] I. F. Wilkinson, "The evolution of an evolutionary perspective on B2B Business," *J. Bus. Int. Mark.*, vol. 21, no. 7, pp. 458–465, 2006.
- [23] P. B. Joseph, "How B2B companies create economic value by designing experiences and transformations for their customers," *Strateg. Leadersh.*, vol. 43, no. 3, pp. 2–6, 2015.
- [24] G. Charlton, "The pros and cons of subscription ecommerce models," *webpage*, 2015. [Online]. Available: <https://econsultancy.com/blog/66034-the-pros-and-cons-of-subscription-ecommerce-models/>. [Accessed: 20-Jan-2018].
- [25] A. Pahwa, "eCommerce 101: eCommerce Business and Revenue Models | Feedough," *webpage*, 2017. [Online]. Available: <https://www.feedough.com/ecommerce-101-ecommerce-business-revenue-models/>. [Accessed: 20-Jan-2018].
- [26] N. M. Sperdea, M. Enescu, and M. Enescu, "Challenges of Managing E-Commerce," *Econ. Manag. Financ. Times*, vol. 6, no. 2, pp. 194–199, 2011.
- [27] Anonymous, "B2B Marketing in the Digital Age," *Teach. Bus. Econ.*, vol. 20, no. 2, pp. 6–9, 2016.
- [28] Anonymous, "BBC prepares UK engineering companies for e-commerce explosion," *Anti-corrosion Methods Mater.*, vol. 50, no. 5, p. 385, 2003.
- [29] Network Rail, "Tender opportunities – Network Rail," *webpage*, 2017. [Online]. Available: <https://www.networkrail.co.uk/industry-commercial-partners/supplying-us/tender-opportunities/>. [Accessed: 19-Jan-2018].
- [30] Network Rail, "Supply of works, services or products – Network Rail," *webpage*, 2017. [Online]. Available: <https://www.networkrail.co.uk/industry-commercial-partners/supplying-us/supply-works-services-products/>. [Accessed: 17-Jan-2018].
- [31] Siemens, "Siemens - Signalling," *webpage*, 2018. [Online]. Available: http://w3.siemens.co.uk/mobility/uk/en/rail_solutions/rail_automation/signalling/pages/signallingandcontrol.aspx. [Accessed: 21-Jan-2018].
- [32] P. Barnes-Vieyra and C. Calvcombe, "Business-to-business E-commerce: models and managerial decisions," *Bus. Horiz.*, vol. 44, no. 3, pp. 13–20, 2001.

E-Commerce Assign1 H.COBBOLD - P149234

GRADEMARK REPORT

FINAL GRADE

87 / 100

GENERAL COMMENTS

Instructor

Good introduction to company and in-depth SWOT analysis at an interesting time for the railway industry including the Carillion collapse. You discussed Brexit later, and this could have been included under Threats/Opportunities as well. Good writing style with an appropriate set of references.

The six phases of B2B purchase are analysed with many examples and good suggestions.. Including examples and screenshots really helps making your points here.

You have enhanced your discussion of Harsco's business model by making justified assumptions - a good feature is clearly stating these. Good business analysis!

Also good explanation of assumptions and background in discussion of E-Procurement. You make a good point about little interaction on their social media channels. I especially like their careers posts "Get your career back on track"!

Hofstede's dimensions of culture applied to the UK and South Africa. A genuine challenge for a multinational company.

Finally some great suggestions, particularly the provision of m-commerce.

Overall an excellent piece of e-commerce analysis applying all areas of theory to Harsco. Well done!

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