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Why can't we have nice things – a transaction economy model of information system usability in firms

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Abstract: Poor usabilty of B2B applications is nothing new, every scientific database is full of articles on how to improve them, but why does it happen in the first place? Turns out the answer might lie in transaction economics, once we view the purchase and use as different transactions. But buying a bad used car (a "lemon") in the market is also nothing new – what new is that getting rid of IT is hard, because usage itself increases costs of switching to a new supplier. Most papers either deal with the internal workinsg of a software development company, or treat technology as something developed internally – yet this is rarely the case anymore, and buyer-seller relationships of technology, along with caveats in the SaaS licensing scheme might give us the answers on the sorry state we might find ourselves in.

Keywords: transaction cost economics; lemon market; usability; technology acceptance model; task-technology fit;software as a service; organizational impacts of information systems

1 Introduction

1.1 A personal motivation as a university lecturer

Why is this particular digital information system for a certain business process inside my institution so hard to use? This is a question many people, including academics certainly ask themselves. If that academic happens to study and teach software ergonomics, the question is even more profound, especially if the task is to document exams and graduations, as the author did the days before writing this paper.

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The paper will go through certain models of firm behavior related to information systems and technology acceptance, a definition of usability in terms of quality, and what comes of it.

1.2 Our example scenario

In order to achieve this goal, we have to provide a hypothetical scenario first, and so we generalize what brought this paper to life: executing a certain business process, which has legal implications (and therefore, compliance requirements), and is mainly about information handling – the given case, grading students in a public university, which of course has legal implications in that it allows students to apply for other academic programs. In order to give a more general case, it can be also declaring compliance to a law. In most countries, incomes and expenses are to be declared towards the respective tax office. In Hungary, invoices are to be declared regularly (Áfa Tv. - 2007. Évi CXXVII. Törvény Az Általános Forgalmi Adóról - Hatályos Jogszabályok Gyűjteménye, n.d.) in a digital channel, and therefore invoicing is a basic business process which can be applied to all Hungarian firms.

Given that such regulatory data is regularly handled by a digital information management system inside a firm, we should be dealing with the usability of that digital information system – documenting grades in the academic case, and filing an invoice in the general firm case. We take it for granted, that the frequency of the task, the e-government oriented legislation around them gave rise of such a system. This is certainly a case in Hungary, but the author hopes that such analogies can be found in universities and firms of most of the developed countries inside and outside the European Union.

1.3 Expected technology landscape

In our model, we expect the user and the technology provider, to be part of two distinct organizations: that is, the user is unable to change the underlying technology without the help of the technology provider. This is certainly the case of most situations, as most users lack the technical knowledge and rights to do so, and even if they did, as we will see, it would cause a lot of costs for the user organization.

The technology provider is responsible for the operation of the system in exchange for regular payments, in our model, instead of a single sum: this is again, a very standard model of such information systems, commonly referred to as Software as a Service (SaaS). If we didn't add this to the model, a technology provider might be interested in acquiring new and new customers. With this added, however, as long as customers keep paying the regular fee, and it is sufficent to cover the incurred costs, the technology provider can be alive on market without acquiring any new customers.

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2 Literature review

2.1 Definitions

2.1.1 Defining usability

This paper primarily bases usability on the ISO/IEC 9241:11 definition, as an extent of user effectiveness, efficiency and satisfaction for a certain scenario. (Speicher, 2015). However, in order to understand it from a quality standpoint, we must define usability as a quality in use (Estdale & Georgiadou, 2018), as it is done by the ISO 25000 standard family. This standard family differentiates "functionality" and "usability". In the ISO 25000 series, effectiveness and efficiency are only resulting qualities of usability and functionality, while in the ISO 9241 series, they are the very definition of usability.

2.1.2 Defining quality

We could define quality as any property that differentiates a product or service on the market, but perceived quality upon purchase and quality in use should be differentiated: while customer attraction is an important factor in market success (Carlgren, 2013), use of such a digital information management system happens usually after the purchase transaction happened (as it will be detailed shortly in the lemon market theory). As we will see in discussion, this has important implications.

2.1.3 Defininining functionality and the difference from usability

For the sake of clarity, in this paper, functionality is what a technology is capable of, and usability is the measure on how well users can leverage that capability. Therefore, when there is something a perfect user might be able to achieve with a technology, the functionality is there, and when it isn't it's an opportunity cost. However, there are cases, where functionality of the product is unachievable by any of its users due to usability issues: if we would provide a white button on a white background with a white text, is the functionality there? Still, literature as we will see differentiates between the two. We will use the differentiation of "cost" and "gain", that is, with functionality, a user is gaining capabilities, but it still costs time to leverage them, or cover the errors. We should note however, that some usability errors once put the City of New York in close danger of literal nuclear extinction, so some errors are infnitely expensive to cover.

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2.2 Theories

2.2.1 Transaction cost economics

As (Williamson, 1981) suggests, in some situations we should focus on transactions to analize firm behaviour. In terms of transactions, we need to differentiate a few: there is a purchase transaction for the information system technology, but there is a transaction where the member of the firm is using the product (and therefore, spends salary). Between the two, there is a transaction of introduction (with different costs and actors) and a transaction of changing the underlying, already purchased/licensed software through development.

2.2.2 Lemon market theory

Akerlof stated in his paper (Akerlof, 1970), that information assymetry, especially in underdeveloped countries, has detrimental effect on the market, as the user might not know the true qualities of the product before much later after the purchase was made. While early focus was on producer (seller) behaviour, later researchers (Vimarlund et al., 2001) (Dimoka et al., 2012) focused on the consumer's situation. In our market model, the seller is the organization providing the technology for the firm, and the consumer is the user of that technology, trying to execute a business process. The transaction we will be focusing on is purchasing technology for the given information system, as this is where the information assymetry occurs: in order to see the day-to-day usability of the product in all scenarios, it has to be used day-to-day. We should note however, that there is an inverse information assymetry as well: the seller doesn't necessary know the actual day-to-day activities of the user. However, as long as the purchase is made, this might not need to bother them.

2.2.3 Innovation fashion theory

If we take information assymetry for granted, when it comes to transactions, especially in purchasing technology for a given tasks, an interesting pattern emerges: word of mouth causes choices to be made based on fashion (Abrahamson, 1991). Since decision makers don't know which technology would lead them to the least expenses later, they might follow other decision makers who had to make a similar decision lately.

2.2.4 Task-Technology Fit

An important connection should be made: generally, individual performance is closely linked to this phenomenon, according to (Goodhue & Thompson, 1995) and it also affects organizational performance, as we see in (Zigurs & Buckland, 1998). However, what is missing is the human characteristics – it is treated as an external variable, but usability research tells us it is not the case.

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2.2.5 The Technology-Organization-Environment framework

Baker's framework (Baker, 2012) tells us, that the external environmental forces, like regulatory requirements, the internals of the firm, including formal and informal processes and structures affect adoption just like the properties of the technology itself.

2.2.6 Technology Acceptance Model

This model tells us that perceived usefulness and perceived ease of use might result in intent to use a system (technology) and therefore, its purchase. It has been extensively studied for SaaS situations (Naqvi et al., 2019). The Lemon Market Theory however tells us, that "perceived" and actual usability might be strikingly different as shown in : suppose we simply bought an application from an application marketplace (Google Play Store, or Apple AppStore), based on screenshots and reviews (fashion!), and only later would have found out, that it doesn't support our particular situation. Therefore, it is fundamentally important, during which transaction does the perception occur.

2.2.7 Cost model of information technology systems

We know that the customer organization will have to pay for the technology provider organization. But based on what? We will use models from (Ohridski et al., 2015) (Herman et al., 2018) and (Alseadoon et al., 2021) to understand what costs we should bear. As for the distribution of such costs, (Yang et al., 2008) tells us that design and code of the system is responsible for more than half of the costs, and there are transition costs to bear (we will separate transition to migration and learning for technical purposes)

3 Methods

In order to marry our models together, we must first make a distinction between purchase and use. Usability, when taken as a cost (effort spent on using the product) happens during use, but this cost might not be imminent upon purchase, even with demo runs.

Let's start with the classic TAM model based on (Davis, 1989; Venkatesh et al., 2003), defining "ease of use" as usability, and usefulness as functionality :

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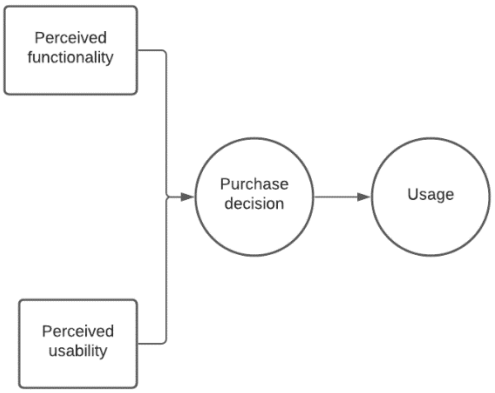

Figure 6 The Technology Acceptance Model viewed as a set of transactions and factors affecting it (based on Davis89)

Usage is a transaction here – but what it contains? Of course, the gains and losses resulting from usage:

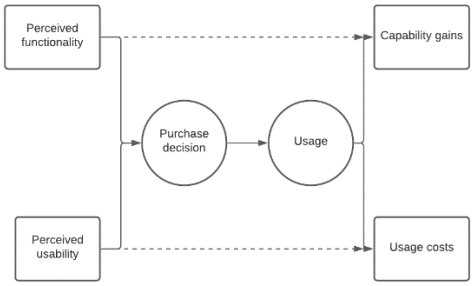

Figure 7 The previous TAM model with resulting gains of functionality and cost of usage added

But in itself, there is a difference, let's call this actual instead of perceived:

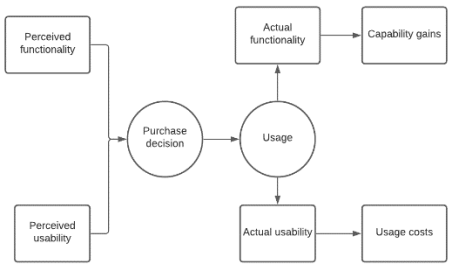

Figure 8 Differentiation between perceived and actual parameters

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Of course, the purchase decision isn't only affected by this alone, usually there is a cost to be paid for the technology provider. Also, there is a learning cost for anyone trying to actually use the system. The difference here is internal and external: no matter how much we pay for the technology provider, every and each user has to pay efforts to learn the new system!

4 Results

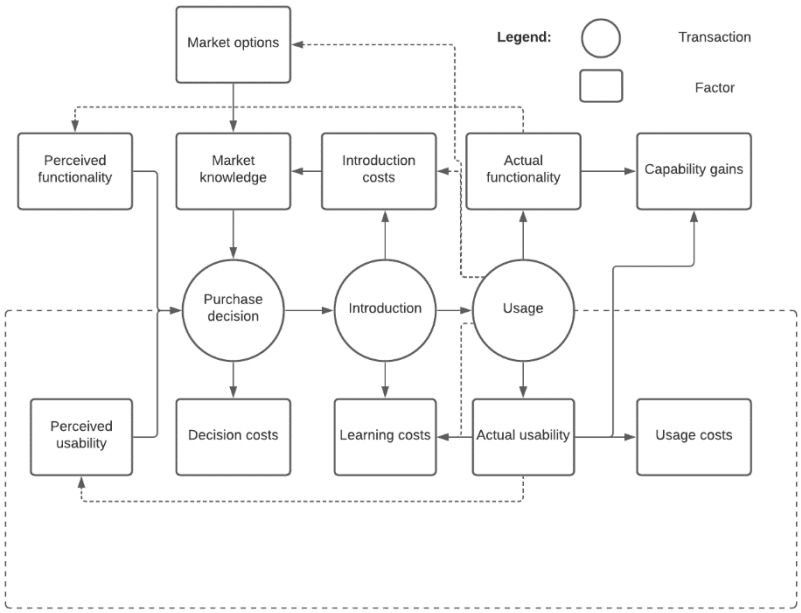

Figure 9 The resulting extended model, marrying TAM with TTF model, showing the assymetry of the market as 3 separate transactions

4.1.1 Transactions

We define 4 different transaction points, providing the backbone of our discussion:

- Purchase decision – the financial transaction involving purchasing, developing, or modifying a technology, or the decision towards it
- Introduction – the costs of introducing the contracted changes - we separate it from the purchase itself as to a lot of customers, its costs are not visible upfront
- Usage – the actual usage transaction (filing an invoice, or grading a stuent)

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4.1.2 Factors affecting purchase

Purchase is affected – according to the TAM – by

- perceived usefulness
- perceived ease of use (together perceived task-technology fit)

and of course every purchase is affected by:

- market knowledge, including:
  - the known available technology vendors and
  - the offered price

The introduction cost is a sum paid for the technology vendor upon introduction. However, total cost of ownership incurs internal costs, such as:

- Learning costs: training of personell, or lost productivity while learning a new / changed system, changing of documented business processes
- Migration costs: changes related to introduce existing data to the new information system and to introduce existing procedures or modify them around the information system

4.1.3 Factors affecting use

Usage comes with time of use, which is directly correlated with the usability of the product. The time spent on using the product is the usage cost.

Usability is not only dependent on the perceived ease of use, but it is the result of actual ease of use. The difference is what we call tacit needs.

Use also comes with the costs of the license fee associated with the technology. It might not involve any kind of change: license fees can be offered for the pure operation of the system by its technology provider, which might only mean providing electricity and networking to a computer.

4.1.4 Factors affecting change

Whenever a change happens, there is a learning cost: if only momentarily, the user needs to re-learn the interface to execute the same tasks. Also, documentation related to connected business procedures might also need to be updated. If the change was requested by the user organization, it might need to bear its development costs; but it could happen, that it is a result of market change by the technology provider.

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5 Discussion

5.1 Usability is a property of technology, but not its quality

From the user organization's perspective, usability is not a quality: actual usability might not affect the purchase decision – as long as other external (eg. legislation) and internal (eg. supporting business procedures) needs are met. However, it is a property, and it changes to a context only when either the context or the technology changes.

It becomes a quality only when it is

- apparent at the moment of purchase (perceived vs. actual ease of use), and
- when there are other market options (including deciding not to introduce technology for the given process at all).

If any of the above two conditions are not met, usability remains a property, but not a quality of the product.

5.2 A cost model for a technology provider

It was shown many times, that compared to development costs, the rest of the costs for a technology provider are largely diminishable. Development only occurs when change occurs. This change might be initiated by external factors (legislation changes, market demand changes, underlying technology changes), or internal factors (new market initiatives, new technology adoption). There are still operational costs like cost of support, electricity and replacement of broken technology, but in the SaaS business model, regular income continuisly has to cover these costs while also gradually covering development costs.

5.3 A stable market

There is a certain notion, that the "market always changes" – in itself it is certainly false: certain markets don't change, let's say, at midnight most local stock exchanges are frozen. For a technology provider of an information management system, the market can change essentially in four ways:

- New customers are acquired from the market
- Existing customers are not retained and lost
- The customer value of existing customers increases (or decreases)
- It expands its activities to new markets

When a market change occurs, that means that the technology firm's performance of acquiring new customers or retaining existing ones is changed, or the technology firm itself has changed to a different market.

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But each of these come with a transaction cost from the side of the customer: if the customer chooses a new technology, it has to stand all the costs related to the introduction of the technology. It even has to bear costs unrelated to its own needs: If expanding to a new market by the provider leads to a generalization of technology (let's say, instead of just a single "issue an invoice" button the technology provider decides to add an "issue a payment receipt" button which requires user to choose between the two options) it might increase usage costs (the decision time between the two buttons) and adds re-learning costs (to update procedures to reflect new system behaviour) even if the given functionality is not used by the given firm.

Therefore, the customer might be

- Interested in keeping things the same
- Its only choice would be to change technology vendor, which would invoke both purchase (or development) costs as well as introductory costs.

5.4 Warning for custom developments

An interesting situation occurs, when for whatever reason, the customer is the sole customer of the technology, and the provider is the sole provider: the provider is not interested in change, as it would not result in acquiring new customers (there is noone else interested), as the sole provider it has monopoly over the technology (the customer has nowhere to change) so therefore it can retain the customer basically indefinitely. Customer is not interested in increasing the usability of the product, as it would have to bear all development costs of such change, even to a profit, and it's up to the discretion of the provider whether to do the change or not.

This can also happen if the system changes: suppose that as a result of change in a business process, the technology needs to be altered: at that moment, no matter how many providers are there, only the current provider can change the technology to suit new needs, for whatever development costs, and disregarding usability – as long as the sole change is even a tiny bit cheaper than replacing the whole system, they are keeping monopoly on this micro-market. Therefore, integrated systems are a trap: the more business function a single technology provides, the more likely is that they can force the customer into a vendor-lock in situation.

5.5 Infinite cost of migration versus new customers

Another common situation is, when the migration costs get high: in practice, migration costs rise over time simply because there is more data to migrate, and its entropy also increases over time. Let's suppose that right after purchase, there is no data to migrate, but immediately after first use, the cost of migrating existing data would be infinite.

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Upon surveying medical GPs, out of the 35 asked, more than 30 used the same program for keeping EHS records they started their career with – and most of them 30 years prior (the average age for GPs was 58 at that time). Therefore products from the 90s were dominating the market, with easy to measure usability issues between the older and newer ones.

Social networks are such phenomena: if people have most of their friends on Twitter, or Facebook, it's hard to migrate activities to a different one.

Yet TikTok and Instagram are well and alive. The reason is the constant influx of new users. Since the GP market is relatively stable, as in, no significant amount of new users are expected, the situation also does not change and competition does not force improved usability.

5.5.1 When negligible costs become a showstopper

Compared to migration costs, learning costs seem to be negligible, and we might wonder, why it is included separately at all; that is, until we realize that each user has to pay it as a natural person: users unwilling to learn a system can be a showstopper, especially if the investment in the learning costs of the previous system is providing the status (and leverage) of the individual. But besides personal costs, this simple step of deployment costs in itself could be prohibitive: a system we were working on failed to be introduced to a new market as its learning cost was two weeks, during which all employees of the potential customer were to be out of their daily job. Therefore, while in software development literature, it is simply part of migration, that is true only from the technology provider's perspective; from the user's perspective it is an internal cost to bear, compared to the external cost of paying the trainer and the developers of the provider.

6 Conclusions

Where is the way out? First off, if we learn to minimize change costs, we are able to minimize usage costs and maximalize gains faster. Good usability minimizes learning costs, and if we separate backend and frontend systems, we might be able to minimize usage costs without paying the full price of migration.

6.1 Further research needed

We need to conduct empirical research supporting this model. It might be detailed more on the technology side, like, what happens if for a single backend (eg. a governmental database of invoices, or university database of exams) there are

competing frontends (client applications) available, or how to calculate when the usage costs outweight the benefits of capabilities.

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References

[1] Abrahamson, E. (1991). Managerial Fads and Fashions: The Diffusion and Rejection of Innovations. *The Academy of Management Review*, *16*(3), 586. https://doi.org/10.2307/258919

[2] Áfa tv. - 2007. évi CXXVII. törvény az általános forgalmi adóról - Hatályos Jogszabályok Gyűjteménye. Retrieved January 8, 2022, from https://net.jogtar.hu/jogszabaly?docid=a0700127.tv

[3] Akerlof, G. A. (1970). The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, *84*(3), 488. https://doi.org/10.2307/1879431

[4] Alseadoon, I., Ahmad, A., Alkhalil, A., & Sultan, K. (2021). Migration of existing software systems to mobile computing platforms: a systematic mapping study. *Frontiers of Computer Science*, *15*(2). https://doi.org/10.1007/s11704-019-8166-5

[5] Baker, J. (2012). The Technology–Organization–Environment Framework. In *Springer* (Vol. 28, Issue November, pp. 231–245). https://doi.org/10.1007/978-1-4419-6108-2_12

[6] Carlgren, L. (2013). Identifying latent needs: Towards a competence perspective on attractive quality creation. *Total Quality Management and Business Excellence*, *24*(11–12), 1347–1363. https://doi.org/10.1080/14783363.2013.776762

[7] Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, *13*(3), 319. https://doi.org/10.2307/249008

[8] Dimoka, Hong, & Pavlou. (2012). On Product Uncertainty in Online Markets: Theory and Evidence. *MIS Quarterly*, *36*(2), 395. https://doi.org/10.2307/41703461

[9] Estdale, J., & Georgiadou, E. (2018). Applying the ISO/IEC 25010 Quality Models to Software Product. *Communications in Computer and Information Science*, *896*(December), 492–503. https://doi.org/10.1007/978-3-319-97925-0_42

[10] Goodhue, D. L., & Thompson, R. L. (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly*, *19*(2), 213. https://doi.org/10.2307/249689

[11] Herman, H., Grobbelaar, S. S., & Pistorius, C. W. I. (2018). Towards a conceptual framework for the design, development and implementation of technology platforms from a platform Owner's perspective. *Towards Sustainable Technologies and Innovation - Proceedings of the 27th Annual Conference of the International Association for Management of Technology, IAMOT 2018*.

[12] Naqvi, H. F., Chandio, F. H., Soomro, A. F., & Abbasi, M. S. (2019). Software as a Service Acceptance Model: A User-Centric Perspective in Cloud Computing Context. *2018 IEEE 5th International Conference on Engineering Technologies and Applied Sciences, ICETAS 2018*, 1–4. https://doi.org/10.1109/ICETAS.2018.8629200

[13] Ohridski, K., Angeleski, M., & Ohridski, K. (2015). a New Methodological Approach for Designing the Software Industry Value Chain. *Ecoforum Journal*, *4*(2 (7)), 87–94.

[14] Speicher, M. (2015). What is Usability? A Characterization based on ISO 9241-11 and ISO/IEC 25010. February. http://arxiv.org/abs/1502.06792

[15] Venkatesh, Morris, Davis, & Davis. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, *27*(3), 425. https://doi.org/10.2307/30036540

[16] Vimarlund, V., Eriksson, H., & Timpka, T. (2001). Economic motives to use a participatory design approach in the development of public-health information systems. *Studies in Health Technology and Informatics*, *84*(May 2014), 768–772. https://doi.org/10.3233/978-1-60750-928-8-768

[17] Williamson, O. E. (1981). The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology*, *87*(3), 548–577. https://doi.org/10.1086/227496

[18] Yang, Y., He, M., Li, M., Wang, Q., & Boehm, B. (2008). Phase distribution of software development effort. *ESEM'08: Proceedings of the 2008 ACM-IEEE International Symposium on Empirical Software Engineering and Measurement*, 61–69. https://doi.org/10.1145/1414004.1414016

[19] Zigurs, I., & Buckland, B. K. (1998). A Theory of Task/Technology Fit and Group Support Systems Effectiveness. *MIS Quarterly*, *22*(3), 313. https://doi.org/10.2307/249668