Business insights in e-commerce and trusted services

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Abstract

The BESTS study was one of the first to explore the business realities, market opportunities and economic implications of the European trusted services (TS) market, especially where certificate authorities (CAs), registration authorities, time stamping authorities – and the digital signature-based public key infrastructure that support them – are concerned. Trusted services are essential for Europe’s growth into the information society, Europe should have native competence in trusted services, but Europe is perceived as lagging behind. We outline the problems European players face when trying to become (and remain) profitable in TS, provide predictions for the future (using four scenarios: growth/explosion, stagnation, maturity and decline/crackdown), and rate the feasibility of the various possible business models. Pervasive myths and misunderstandings surrounding trusted services are clarified. Included are the top 10 findings and predictions from the study in the following areas: business opportunities, branding, infrastructure costs, product differentiation among CAs, user education, alliance education, degradation of consumer confidence, finance, regulation, and market stimulation by government. ©2000 Published by Elsevier Science B.V. All rights reserved.

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1. The BESTS study

1.1. Goal

BESTS (www.bests.org) – the Business Environment Study of Trusted Services – was a year-long study carried out during 1998 for the European Commission (EC). The rationale behind commissioning the BESTS study was that it was perceived that trusted services – such as, but certainly not limited to certification authorities (CAs) – were essential for Europe’s growth into the information society, that Europe should have native competence in trusted services, but that Europe was somehow lagging behind North America.

BESTS investigated the elements impeding businesses from entering the European Trusted Services (ETS) provision area, identified bottlenecks and proposed scenarios for creating a favourable business environment for ETS service providers. The field of ETS in the study is not limited to consumer electronic commerce and secure messaging but encompasses all areas of interaction between suppliers and consumers of all kinds, including such areas as health care, citizen interactions with government (e.g. registration, tax payment, debate and elections), banking, business information, entertainment, and access to community information.

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1 http://www.bests.org

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1.2. Content

The main issues questions BESTS attempted to answer were as follows:

- Are there aspects of the current international environment which give rise to uncertainties and risks for the business community? What, if anything, is preventing European businesses from entering into and remaining profitable in the TS industry?
- Is there a ‘chicken and egg’ situation and if so, how can this impasse be broken?
- What should be the role of government in providing a favourable legal, regulatory business environment, including limits and alternatives to regulation?

BESTS is ultimately a business-oriented study. However, besides a business component, the study also had three other equally important components – technical, legal, and governmental:

- **Technical**: until now, most activity in the trusted services field has been of a technical nature. For the past decades, huge technical advances have taken place in such areas as cryptography, networking, and processor speed. BESTS asked whether the technologies are sufficiently mature to enable proper service development, and which technical issues would still hinder this development.
- **Legal**: as in many fields relating to the information society, new or apparently new legal issues arise following technological developments. BESTS aimed to determine where existing laws we appropriate for direct application to the online world of trusted services, where existing laws must be clarified or expanded, and in which areas wholly new laws should be made.
- **Governmental**: national and supra-national (e.g. the EC) government can be involved in the TS market in two distinct ways – as a market player (providing and using trusted services internally and with its citizens in such applications as voting and the filing of income tax returns) and as a regulator. BESTS focused on both. In the second role, BESTS aimed to identify when government should leave developments to the market (e.g. to self-regulation and contract law) and where a more proactive role is required to foster a favourable business environment or to protect the ‘general’ interest. The study looked at both the European and international context of regulation, due to the cross-border nature of trusted services.

1.3. Participants

For all BESTS seminars and panels, it was essential to invite experts active in the trusted services field. The panel invitees were invited primarily for what they could contribute to the results of the study. Another condition was that a wide range of the top organisations making a difference in the trusted services industry today be represented. All attendees were personally chosen for their competence and experience, including substitute attendees. This helped minimise the problem whereby the results of a given study suffer due to the fact that top organisations are present at a panel, yet top contributors are not.

Geographically, most invitees were distributed among the 15 EU member states. However, we also looked to other countries on the European continent (such as Norway and Switzerland), to North America, and even as far afield as South Africa. Our rationale was that, while BESTS is focused on the EU market, one cannot ignore the fact that a large amount of trusted services expertise and business activity is located outside the EU, most notably in North America. We felt it was in the interest of the BESTS results that external expertise be leveraged whenever practicable.

Our panels and seminars brought together CAs, system integrators, insurers, technology providers, telecoms, major industrial and service firms, and computer companies such as British Telecom, Entrust, GlobalSign, ICL, Shell, Sun, Thawte, Think, UPS, USF&G, VeriSign and Visa, to tell us about the real-world problems they faced. It became apparent early on in BESTS that it would not have been enough to just talk to major trusted services players, such as the major CAs, private label implementors, integrators, and software and hardware vendors – venture capitalists, academic research labs, and chambers of commerce were invited as well.

1.4. Scenario gaming

In these seminars, we used scenario gaming to focus the discussion and to encourage outside-the-box thinking. The scenarios are fictional futures the semi-
nar attendees were asked to envision – to live inside – while the discussions took place (the scenario methodology was only used during a portion of any given seminar day).

Scenario gaming (a form of seminar gaming), a technique which the RAND Corporation has refined over the past decades, is defined as ‘a group-based consideration of a problem’ and ‘role-playing in a realistic but hypothetical scenario using representatives of stakeholder groups as a way to develop alternative strategies for real-world situations.’\(^2\) RAND first developed the technique for the defence sector (e.g. crisis management), then expanded its use to the social policy sector (e.g. urban drug abuse and violence) and other areas such as land use, water management, and policy vision for governmental agencies.

Through BESTS, its application was expanded yet again – this time to the field of European trusted services. The scenarios provided a concrete focal point for group discussion and, among other things, were useful for keeping complex discussions on track. While they are chosen for the valuable experience gained in their careers, scenario gaming helps participants to temporarily step outside their current roles, place themselves in other roles, and to speak openly.

The four scenarios used were Growth (also known as Explosion), Stagnation, Decline (also known as Crackdown) and Maturity:

- **Growth (also known as Explosion):** the use of CA services and products experiences exponential growth as more business processes, including financial transactions, are migrated from traditional paper-based procedures to those online.
- **Stagnation:** conflicting national legislation in Europe and conflicting state and provincial legislation in North America (and an Asia preoccupied with financial problems) slow the pace of progress. A classic ‘chicken and egg’ impasse develops in the commercial sector.
- **Decline (also known as Crackdown):** after a fairly long run of solid growth years in the PKI industry, a series of highly-publicised scandals and lawsuits, plus a number of serious failures in ICT infrastructure worldwide (exacerbated by persistent Year 2000 problems), forces government to step in.
- **Maturity:** after a fairly long run of solid growth years in the PKI industry, with the attendant shakeouts and corrections, the industry has settled considerably and is healthy.

Besides stimulating the exchange of ideas that led to a number of our ‘top 10’ business findings and the myriad results that comprised the technical, legal and government components of BESTS, the use of scenario gaming also resulted in some conclusions related to the scenarios themselves. For example, we found that the industry is now well into the growth scenario. In fact, in some parts of the trusted services industry, the maturity scenario has started to manifest itself. This statement is borne out by the observation that it has already become difficult for the operators of commercial, end-user CAs to differentiate their products from each other. It is interesting that, in a business so young, we already see signs of reaching the ‘Coke and Pepsi’ stage, where vendors supply products that are, in some ways, essentially the same and must search for ways to differentiate them.

### 2. BESTS business findings and predictions

A year full of panels, seminars and personal conversations covering the four main trusted services discussion categories (technical, legal, government and business) resulted in reams of insights, facts, opinions – and some contradictions. The objective of this paper is to distil this wealth of information into 10 of the most important, far-reaching and, importantly, original, conclusions from the business sector. Naturally, plenty of perfectly good and useful findings are, of necessity, not present in the business top 10.

BESTS strived to come up with original results. Findings which, while perfectly valid, had already found their way into the body of received knowledge on the subject were not considered part of the body of original results. These business findings and predictions are emphatically not only concerned with business. Technical, legal and governmental issues are, by necessity, inextricably interwoven into the entire list.

The top 10 business findings are not ranked in any particular order.
2.1. The top 10

**Business opportunities:** as far as CAs are concerned, we often heard and talk about starting up in the CA business – How should you present your certification offerings? What market do you want to reach? What is the cost/benefit? etc. The underlying assumption in many of these cases is that we are talking about a stand-alone, commercial, consumer-oriented CA selling digital IDs and performing certification. In fact, new CAs from here on in will fall into one of a few specialised categories, but that of stand-alone, commercial, end-user CA will not be the most prominent of them.

The primary business opportunities surrounding CAs and related services are:

- Handling the needs of small and medium-sized enterprises who need at least basic trusted services, yet cannot afford their own infrastructure.
- Systems integration and consulting.
- A full-sized, commercial CA selling server certificates.
- A ‘branding registration authority’ using large commercial CA on the back end. This recognises the big role we think branding will play in trusted services. A branding registration authority (RA) conveys the brand at street level to the consumer. It is not obvious to the consumer that the mechanics of certification and related activities are handled by one of a few large CAs.
- Private-label implementations, which includes issuing ‘club’ certificates. Club CAs issue certificates as an integral part of becoming associated with joining a ‘club’, such as opening a bank account, becoming a customer of an online retailer, being an employee of a company (and using your company’s intranet), or being enrolled in an educational institution.

Part of the reason for the predicted rise in usefulness of the club certificates lies in the notion that certificate products work best with one-to-one binding of the certificate with a single service. This is due to the fact that users of all types frequently fail to appreciate their underlying responsibility vis-à-vis a certificate, such as the fact that they should not put certificates to uses for which they are not intended. This type of misuse – using a certificate to certify something that it was not intended to – is a historical problem with credit cards (which are certificates in their own right), whereby, for example, people use their visa card not to make a purchase but to identify themselves or to show that they are trustworthy.

**Branding:** Higher consumption levels will force a supply-side shakeout in e-commerce (this can be viewed as a key component of the growth scenario morphing into the maturity scenario). This shakeout will be characterised by relatively few big players moving in relatively big ways to excel in – possibly even dominate – e-commerce. These big players may not come from the most obvious sectors. They may not be information industry players, like Microsoft and Sun. They may not be content industry players, such as the big publishers and record companies, or the various CD vendors. They may just be solid, well-known goods and services companies with something to sell or a clientele to communicate with, the wherewithal to market their products successfully and – most importantly – owners of a globally recognised, trusted and admired brand name.

In fact, UPS, the global parcel post carrier, and, separately, the Dutch post office, have recently launched document delivery services, where they deliver messages and documents securely over the Internet. How do consumers know it is secure? They do not, but that is unlikely to matter, due to the huge base of consumer recognition and trust enjoyed by both of these organisations.

**Infrastructure costs:** the high cost of running a commercial CA is not in the basic technical set-up, but in (a) providing guaranteed high levels of service (i.e. high availability) and (b) passing audits. Setting up a CA is expensive if you look at the total business cycle (setup, establish your presence in the market, build trust, maintain quality, implement procedures, etc.) but deceptively cheap if you look only at the pure technical implementation.

**Product differentiation among CAs:** in the single-user market, it is difficult to differentiate between certification services offered by two competing CAs. Level and quality of insurance coverage, as well as reputation, are the two main mechanisms for differentiating these types of services.

**User education:** the Internet boom occurred when Web browsers provided an easy, graphical way to access information on the Internet. This same ease is now needed in the TS sector. The acquisition, payment, confirmation, use and management of certifi-
cates are relatively mysterious to users. Furthermore, to the end-user, trusted services – if they are operating properly – are nearly invisible. It is only when something goes wrong that the user normally becomes aware of the trusted aspect of whatever information service they are using. It is also not straightforward to explain to potential users the rationale for buying a certificate (especially since so few Websites demand them). It is significantly more difficult than explaining the benefit of using a word processor or a printer, for example, since the output of the latter are much more tangible.

**Alliance education:** The education problem goes well beyond end-users. Education is a time-consuming, costly task for CA companies. Insurors, potential private-label clients, integrators and consultants to which potential private-label clients listen to must all be educated.

**Degradation of consumer confidence:** The instability and unpredictability of the legal and regulatory framework surrounding trusted services and, by implication, the electronic commerce applications built upon them, is one of the biggest headaches for business. This was a clear call for action on the part of governments.

But what seems to worry trusted service businesses more is not the threat of lawsuits or even the resulting penalties they might have to endure. They are most worried about trust, and the marketing setbacks that would result due to a degradation of consumer trust in the event of a lawsuit, even if they win the lawsuit (this type of incident would be characteristic of the ‘Decline’ scenario). The trust issue is so important that TS businesses are less worried about something as serious as the direct ramifications of losing a lawsuit than they are about what consumers will *think* about the fact that a lawsuit was brought in the first place – even if they (the TS businesses in question) were to win the lawsuit (This concern is more prevalent in the US, where TS-related lawsuits are likely to be more common and to involve larger penalties).

**Finance:** Due to a lack of understanding of this particular business, the majority of financiers, including most banks, will not invest in CAs (although a consortium of banks is working to develop CA services together, but for their own use, not as a profit-making external investment). In addition, the ‘garage’ days – when a few entrepreneurs with a CA business plan – are over.

**Regulation:** Regulation is something which trusted services players generally do not want. In the opinion of CA operators, for example, regulation is not necessary, as it will do little to increase consumer confidence, which, as we have seen, is a prime concern. However, a trade association is thought to be beneficial, and some have been started.

Probably the best meta-scenario would be a period of strong ‘Growth’, followed by a smooth transition to the ‘Maturity’ scenario. If regulation is to occur, the point at which it should be introduced is at the end of the ‘Growth’ scenario (assuming that we know when we are in the end of the Growth scenario). If the ‘Decline’ scenario occurs, and government decides to ‘Crackdown’, it will be, by then, too late for regulations to help much.

**Market stimulation by government:** A government-mandated trusted service application (e.g. tax collection, voting, supplier trade) would be excellent for building a critical mass of users and trust. However, since it is difficult for private players to compete with work-alike trusted services – such as an online messaging service run by a national post office – the government may want to limit its involvement to low-end, low-insurance-value services and leave the rest of the marketplace to private companies. Of course, in many countries, the post office is a private company.

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Further reading


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