

ISO 10008 in Two Engineering Courses

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Abstract

Implementation of the ISO 10008 customer satisfaction standard for “business-to-consumer electronic commerce transactions” in two undergraduate engineering courses with close to 176 students is illustrated. Two main goals are to demonstrate usage of ISO 10008 for an electronic delivery of engineering program material through course sites and emails, as well as to verify that such an application of this standard can help achieve an increase in student satisfaction regarding the course sites. The courses were taught by two different professors through classroom lectures and during successive semesters of distinct academic years in a Western Canadian university. Website provision was ISO 10008 standardized in both courses, while the standard was also deployed for student – professor emailing in one course only. Following these ISO 10008 augmentations, the medians of student satisfaction with the course sites, measured on a 1-5 scale, increased in both courses, namely by 0.32 and 0.5 compared to the beginning of the terms, respectively. This was among the first ISO 10008 research implementations.

Keywords

ISO 10008; Electronic Commerce; Customer Satisfaction; Engineering Education; Management System Standards; ISO 10000

1. Introduction

In Paris, ISO 10008 joins other augmentative Customer Satisfaction (CS) Management System Standards (MSSs) that were discussed at the “Excellence in Services” conference in Huelva (e.g., Zayas et al., 2016), namely ISO 10001/2/3/4. It completed the CS group of five ISO standards, as it was the last to be originally published five years ago. Since ISO 10008 “provides guidance to organizations [...] concerning business-to-consumer electronic commerce transactions (B2C ECTs)” (ISO, 2013), it stands out from its four customer-oriented universally-applicable counterparts. Despite its focus on “consumers” and specificity to “e-commerce”, ISO 10008 can be used in non-commercial activities, such as engineering education (Vargas-Villaruel, 2015), which could augment seemingly low applications. For example, 38% and 68% of organizations registered to both ISO 9001 and ISO 14001 in Serbia and Spain, respectively, were not aware of ISO 10008 (Karapetrovic & Spasojevic-Brkic (2014) for the former study and Zayas et al. (2016) for the latter). Furthermore, no companies from the Karapetrovic & Spasojevic-Brkic (2014) sample implemented ISO 10008, albeit in the same year in which the standard was published.

This application of ISO 10008 in engineering education has been preceded by such deployments of other CS standards (e.g., see Karapetrovic & Doucette, 2009; Fernandez-Ruiz et al., 2017). In the case of ISO 10008 specifically, concept interpretations (e.g., of “B2C ECT” from sub-clause 3.1 and its component terms) and applicability analyses (e.g., of sub-clauses 6.1 for “content”-related processes, which were incorporated, as well as 6.2 for “quotes” and “payments”, which were not) were however needed. Regardless, the three overall objectives of ISO 10008 given in its introduction are clearly applicable to both universities and engineering professors.

Two mutually-exclusive courses taken by undergraduate engineering students at a university in Western Canada represent the scope of ISO 10008 implementation shown here. Two different professors taught them to a total of 176 students, respectively, in successive semesters of the same calendar year, but over two academic years. The B2C ECTs included the websites for both courses, as well as the emails between the professor and the students in one course only. Since the websites and emails were just augmenting classroom lectures, these two courses would be “web-facilitated” (Dziuban et al., 2004) or “m-learning” (Kumaran, 2008), but not “blended” (Dziuban et al., 2004; Tang, 2014) or “e-learning” (Wu et al., 2010). Considering the goals (e.g., effective delivery of engineering material through the course site and email), resources (e.g., professors and researchers establishing the site and emailing students) and processes (e.g., developing the site and sending emails) as a “B2C ECT system”, the ISO 10008 standard could be implemented.

Details on the context and content of the ISO 10008 application in each course are given in the following section. Subsequently, the respective B2CECT systems are described. Selected results of ISO 10008 student satisfaction surveys are then illustrated in the penultimate section. Finally, a summary of usage of this augmentative CS MSS is provided.

2. ISO 10008 Application

Through a project approved by the university research ethics board, ISO 10008 was deployed as a principal standard, i.e., independently of ISO 9001 or other quality MSSs, in two courses named “E1” and “E2” hereafter. The overall number of “indirect research participants”

for the course “e-class” sites – related B2CECTs was 176, which included all students (110 in E1 and 66 in E2) enrolled in the courses. The students answering ISO 10008 surveys participated directly, encompassing 43% and 35% of the E1 class for the initial and final surveys, respectively, as well as the analogous 15% and 30% in E2.

With respect to the interpretation of ISO 10008: 2013 Clause 3 terms in course E1, “B2CECT” (sub-clause 3.1) was defined as the course E-Class site, the “*organization*” (3.2) consisted of the professor teaching E1, the researcher supporting the course E-Class site design and the researcher’s supervisor and the “*consumer*” (3.3) was each student enrolled in E1. The “*product*” (3.4) comprised the course material delivered through the course E-Class site, both within the site sections existing before the ISO 10008 implementation, such as the “course outline”, “lecture slides” and “sample exams”, as well as the ones added during the application, for instance the “assignment status”, “calendar”, “online learning tools” and “survey results”.

For the E2 course, the concepts from Clause 3 of ISO 10008: 2013 were largely the same, except the “B2CECT” add the email, the “*organization*” (or “*business*” in “B2CECT”) was only the professor who offered the course, and the “*product*” included the files posted in 12 course site sections (e.g., “current schedule”, “lecture questions” and “ISO 10008 Study”) that remained the same during the implementation. In addition to E2, a professor’s guarantee of a 24-hour email response time and student feedback provided through the site or email were applied.

3. System

The B2CECT system implemented in E1 and E2 courses is explained here briefly, but will be illustrated in Paris in more detail. The system identified students and other stakeholders, such as the engineering department offering the courses and the university, and contained 10 subsystems structured into three phases based on the ISO 10008: 2013 standard (Vargas-Villarroel, 2015). Each “phase” referred to two of the six processes stated in the standard (e.g., “*planning and design*”) and specific ISO 10008 clauses or sections (e.g., clause 5 respectively). The “*development and implementation*” phase included subsystems related to both the main B2CECTs applied in the courses [e.g., “*Establishing / updating course site / email*” (labelled as “DI1” below, ISO 10008 sections 6.1.2 - 6.1.4) and “*operating course site*” (6.2.3, 6.3.2 and 7.1.3)] and the augmenting modules (e.g., “*feedback handling*” (7.1.4 and 7.1.5) and “*security*” (7.2.2)]. Not all subsystems were implemented in both courses [e.g., “*answering student inquires*” (6.2.3 and 6.3.2) and “*managing B2CECT code*” (7.1.2) were only used in E2]. Finally, the “*maintenance and improvement*” phase had three related subsystem [e.g., “*performing corrective / preventive actions*” (6.3.3 and 8.5) and “*monitoring / measuring student satisfaction*” (8.3)].

To demonstrate the deployment of the B2ECT system, an example of the DI1 subsystem in course E1 is used (Vargas-Villarroel, 2015). The processes in this subsystem followed ISO 10008 sub-clauses 6.1 and 7.1. For example, section 6.1.3 of the standard implies that the information on the course site should be accessed by the majority of the students and that the professor should deliver sufficient information to students about the course in general and the B2C ECT system in particular (ISO, 2013). Therefore, the professor should identify the channels for communication with students (e.g., course site, which was chosen in E1, as well as email, phone and/or social media platforms, which were not) (ISO 10008, 6.1.3.1). The course site establishing was based on ISO 10008 section 6.1.3 and 6.2.2 guidelines and the

Moodle platform used at the university where E1 and E2 were taught. For instance, “course site interface configuration” (ISO 10008, 6.1.3.2, second paragraph) included choosing the “*Topic*” *Moodle* format for the site with 10 “topics” (or sections) originally, while a “complementary communication channel setup” referred to the existing *Moodle* “*announcement forum*”. As an example of another DI1 process, namely the “complementary course site content setup”, a section for displaying the professor’s and teaching assistants’ office hours and contact information was added.

The subsequent DI1 processes of “course site interface review” was undertaken throughout the semester. The E1 course site had three major settings: the professor’s initial version before the start of the study, the next one after the application of the first ISO 10008 student satisfaction survey and the final design after the second such survey.

At the beginning, the course site was configured with the *Moodle* course layout called “*show all sections in one page*”. The course outline was presented in a PDF file at the top of the course site, lecture slides were placed in different “topics” also as PDF files, the forum “announcement” below the course outline and assignment files. The site had not used the *Moodle* “*completion tracking*” feature, which was unchanged during the study, although switching it on would comply with the guidelines from section 6.3.2 “Delivery” of ISO 10008.

In the second setting, although the “Topic” format was kept, the sections were named (e.g., “lectures”, “assignments”, “quizzes” and “ISO 10008 Study”) and populated by the files previously uploaded by the professor. Among further changes, the Course Outline was provided in the *Moodle* “*Tab Display*” format and six new “products” (ISO 10008, 3.4) were added. These included, for instance, the “Current Schedule” and “Assignment Status” as *Moodle* “*pages*”, as well as five presentation files and the initial ISO 10008 student satisfaction survey PDF report for the new “Online Learning Tools” and “ISO 10008” sections, respectively. A “product” that did not feature in E2 was the *Moodle* “Calendar”, with the milestones established in the Course Outline, such as due dates of assignments, times of the midterm and final exams, and a direct link to the professor’s email address, since that was requested by the students in the initial ISO 10008 survey.

Finally, the third setting encompassed the creation of a new section called “E-Class Support” to meet guidance from section 7.1.3 of ISO 10008 and the incorporation of labels in the “Lectures” section to separate the lectures by chapters of the textbook.

4. Satisfaction

Another B2CECT subsystem briefly illustrated here for both courses is MI3, established due to sub-clause 8.3 of ISO 10008, which states that the organization should “... *to determine the satisfaction of consumers with the B2C ECT system and its implementation*” (ISO, 2013). Therefore, three related classroom surveys were used in E1 and E2. Selected results from the “initial surveys”, answered by 47 and 10 students at the beginning of each four-month semester in E1 and E2, respectively, and the end-of-semester “final surveys”, with 39 responses in E1 and 20 in E2, are shown. Valid responses needed to contain student check-marked confirmations of two statements related to the ISO 10008 study consent and withdrawal, respectively.

One of the questions in the “initial surveys” was related to the usefulness of the potentially-used course site resources, both for the course itself (e.g., “Current Schedule”, which was answered positively by 98% and 80% of the students in E1 and E2, respectively) and the ISO

10008 implementation (e.g., “Survey Results”, with about half of the students indicating “yes” for their usefulness). Another one was investigating student satisfaction with the course site, with the medians of 3.87 in E1 and 4.25 in E2.

In the “final surveys”, student satisfaction with two other B2CECT system elements apart from the resources (e.g., the mean for usefulness of the “ISO 10008 Study” section in E2 was 3.35 / 5), namely goals and processes, was also measured. For example, regarding the former, exactly half of the E2 respondents were “neutral” on the statement that the ISO 10008 guarantees and surveys improved their course satisfaction. With respect to the latter, 72% and 75% of students in E1 and E2, respectively, indicated that they “agree” or “strongly agree” with the statement that the frequency of ISO 10008 surveys was adequate. On the same course site satisfaction question as in the “initial surveys”, the medians were 4.19 and 4.75 in E1 and E2, respectively.

5. Conclusions

This study demonstrated that the ISO 10008 standard for “Business to Consumer Electronic Commerce Transactions” (B2CECTs) can also be implemented in engineering courses with websites and emails supporting course delivery. The standard was applied in two undergraduate single-semester courses attended by 176 students in a Western Canadian university, with the median course site satisfaction increasing in both courses, namely from the beginning of the semester (3.87 and 4.25) to the end (4.19 and 4.75, respectively).

The main ISO 10008 application characteristics in the two courses were briefly illustrated first, followed by a description of the related B2CECT system establishment in each course. Selected results of monitoring student satisfaction with the B2CECT system and its subsystems from the two out of three surveys conducted in these courses are then presented. For example, in the “initial survey” in both courses, the students considered the posting of “online learning tools” (81% and 100%) to be more useful than the “survey results” (51% and 40%, respectively).

Although the standard itself has been available for five years now, this usage in engineering courses seems to be one of the first ISO 10008 research applications overall. Hopefully, therefore, implementation of ISO 10008 and the related augmentative standards will increase.

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