Implementing Business-to-Customer, IT Outsourcing and Workflow Management System to Exploit China Education Market for Durham University

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Abstract—**Currently, education has become a business sector that provides service to students. This service is developing standards more similar to consumer goods marketing. As a higher education organization, Durham University aims to top education and research across all disciplines in 2020 in UK, which needs the support of the most able and motivated students, academic staff and sufficient money. During the past two years China was the top international students sending country to UK, who pay highly tuition fees. Chinese shows high academic capabilities in variety academic field as well. In this situation, DU should enhance its current strategies to exploit this most talent market with implementing Business-to-Cusiness (B2C), IT outsourcing (ITO) and Workflow Management System (WfMS). These initiatives, significantly achieving customer satisfaction (CS), long-term development, flexible risk management, cost saving, short develop timescales and effective organizational management. Importance-Performance Analysis tool and decision value theory will be introduced to evaluate these initiatives.**

Keywords-B2C; ITO; WfMS; Customer satisfaction; Cost saving

I. INTRODUCTION

Currently, education has become a business sector that provides service to students [1]. This service is developing standards more similar to consumer goods marketing [2]. Durham University (DU) owns high academic reputation in human sciences and aims to top education and research across all disciplines in 2020 in UK [3,4], which needs the support of talented students, staff and sufficient money. China was the top overseas students sending country to UK Higher Education (HE) in 2013/14 and 2012/13, which separately shares 20.28% and 19.84% of UK's international students [5]. Additionally, Chinese currently show highly academic abilities. Hence, DU typically places its market in China and promote e-business on attracting the most able

and motivated students and academic staff. Companies likely to succeed in e-business concentrate on linking e-business knowledge to their core business, enabling technology, gaining customer satisfaction (CS) and maintaining online operations [6]. Hence, DU will focus on achieving CS, overcoming international business barriers, saving cost, enhancing management capabilities. Business-to-customer (B2C) [7], IT-outsourcing (ITO) [8] and Workflow Management Systems (WfMS) [9] are introduced to deal with these issues. This report prioritizes these initiatives as B2C, ITO and WfMS.

II. DU

A. Student Market Organization

DU operates recruitment by cooperating academic staff of each discipline with marketing office [10]. Fig .1 shows the scope of the organization. DU finance experienced gradually increases in terms of net income for the past five years (Fig.2). However, its finance takes no advantages compared with peer universities in terms of rank and reputation (Tab. I). Fig .3 [11] shows DU's 2014 income components. Tuition fees is clearly one of the main kinds of income to DU. Compared with Home students, Chinese students pays about four times of fees, such as Table II .
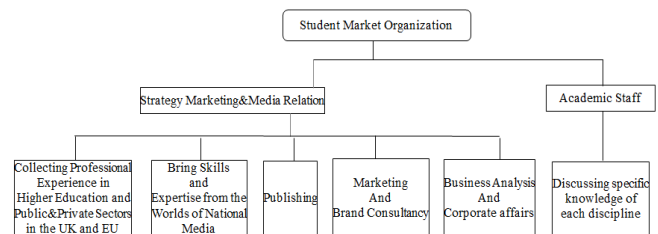

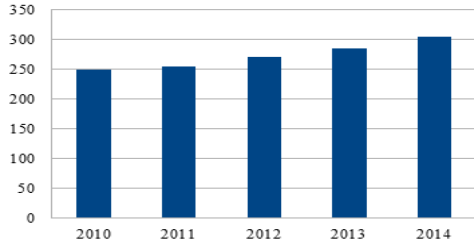Figure 1.   DU Student Market Organization

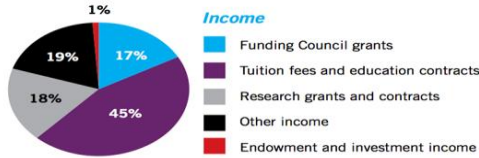Figure 2.　The Net Income of Durham University (million) for Five Years

Figure 3.　Income Component of Durham University

TABLE I.　NET INCOME AND ASSET OF PICKED UNIVERSITIES AT 2016

2016	Net Income(m)	Net Assets(m)
University of Durham	283.34	287.89
University of Manchester	826.97	826.54
University College London	937.24	811.7
Imperil College London	822	1002

TABLE II.　TUITION FEES FOR ACADEMIC YEARS 13/14 AND 14/15

	13/14	13/14	14/15	14/15
Nationality	Home	Chinese	Home	Chinese
Classroom(PGR)	£3,900	£13,300	£3,996	£14,000
Laboratory Based(PGR)	£3,900	£17,000	£3,996	£17,900
Premium Classroom(PGR)	£3,900	£13,300	£3,996	£14,000

B. IT System (ITS) and Website Quality

DU's ITS first introduced in 2000 [10] and ran about 15 years, which provides tools and applications that support campus-wide business and academic applications. The ITS's last year's cost is around £3,580,000 which mainly includes IT infrastructure, maintenance, depreciation and staff cost. This ITS is based on the theory of Blackboard Systems (BS) [10] (Fig .4). This enables DU to figures its basic components as Fig .5. Knowledge Sources (KSs) contain the problem-solving knowledge and each KS works

independently. Blackboard is a global structure for all KSs. Control component directs the problem solving process by allowing KSs to respond to changes on the blackboard database [10]. Robust database system and enjoys edit flexibility.
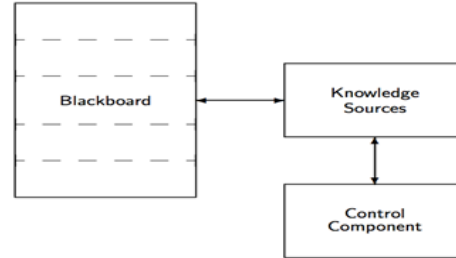

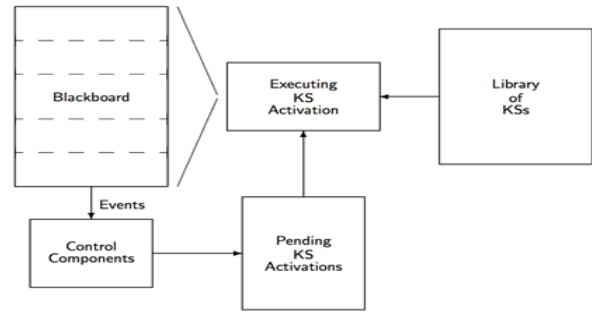Figure 4.　Basic Components of the Blackboard Model

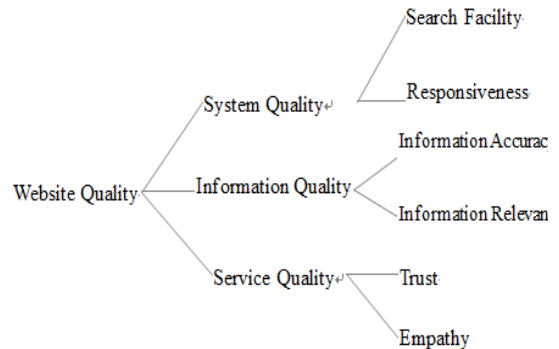Figure 5.　Basic Components for Durham University's IT System

Figure 6.　Website Quality Components

Website quality (Fig .6) should consider both system-oriented and service-oriented quality [12]. System-oriented quality mainly refers to search facility and responsiveness. Search facility reflects whether a tool or structure actually helps a website user to find perceived information [13]. DU includes a search engine in its ITS to mitigates the difficulty to find all the information in a specific subject. Additionally, tools like menus, frames and image maps are processed to avoid navigation problem [14]. DU accesses responsiveness by shorting search and load time [15]. Hence, DU runs well

system-oriented quality. However, the lack of customer knowledge impedes service-oriented quality.

Therefore, DU's ITS can well support its e-business. The weaknesses are customer-related issues, limited financial budget and highly human-related recruiting organization. With adopting suitable strategies, current capabilities and resources can support DU exploits China market.

III. STYLINGSTRATEGIC E-BUSINESS INITIATIVES

DU recruits Chinese through two traditional ways: exchanging students and staff with local universities and dealing with personal online application. Although it admitted enough people, it not means that these people are qualified as the university expectation. Poor business performance and repeat patterns of existing behavior are symptoms of failure [15]. Thus, DU updates its current e-business behavior by conducting B2C, ITO and WfMS.

A. B2C

B2C refers to companies and their customers perform online commerce via Internet-based technologies [16]. B2C concentrates on developing knowledge relevant to their core business and considers changes that may occur in customer relationships and create response solutions [6]. Additionally, a firm's effectiveness on fulfilling orders in B2C transactions is a significant determinant of customer satisfaction (CS) [17]. It can be seen that B2C combines of strong customer focus. Increasing CS increases customer loyalty [18]. However, there are also impediments for B2C adoption. For example, compared with e-business, CS is less challenging in conventional business [19] where customers are immediately empowered with the required information for decision making. It indicates that delivering trustworthy information to customers are crucial in e-business. Thus, B2C should manage both system-oriented and serviced-oriented CS. System-oriented CS mainly refers to provide customer with a usably, availably and effectively website. Service-based CS especially satisfies customers through providing highly accuracy and relevance information and trustworthy service.

One of DU customer-related issues is trust which is well recognized as one of the strongest effects on e-business [20]. Based on B2C, trust can be achieved through both system-oriented and service-oriented level. DU has successfully attained highly system-oriented quality as mentioned. In service-based level, DU should offer a guest role to potential members. This service enable them share ideas with professors and students freely and access trustworthy information. This real life experience of being a member of the university improves their confidence to the university. Therefore, B2C adds significantly CS advantages to DU, which provides the wanted members more opportunities to know the university and then trust the university.

B. ITO

ITO means handing over the management of part or all of an organization's information technology, systems and related services to a third party [11]. It is well recognized

that global ITO is a lucrative alternative in capital market gains cost savings, skilled labor and short marketing development time [21]. Furthermore, it collects local data for marketing and customer analysis effectively. It proves that cost reduction, business performance improvement are the mainly motivations for outsourcing [22]. However, varieties of barriers prevent companies integrating business into global market, like time zone difference, channel conflicts, legacy system and cultures. Current study shows ITO performance is significantly related to the following three factors of organization:

1) Finance: Compared with peers, poor finance companies are more likely to conduct ITO and organization size and industry have no significant effect [21, 22].

2) Percentage of IT budget and/or types of outsourced functions: Companies outsourced less than 80% had success rate of 85%, oppositely success rate was 29% [23].

3) Types of outsource functions: Outsourcing system operations and business process gain higher levels of satisfaction than outsourcing systems management and applications development [24].

The characters of ITO is suitable to DU. Firstly, DU's finance situation takes no advantages compared with peers (Tab .II). Secondly, DU only outsources less than 40% of its marketing functions (Fig .1): marketing and brand consultancy, business analysis and cooperation affairs. Finally, in China there are numbers of high quality intermediary agents that provide DU a large pool for cooperation. Therefore, ITO contributes cost mitigation, short timescale and effectively marketing specification to DU.

C. WfMS

WfMS is a system that completely defines, manages and executes workflows through the execution of software whose order of execution is driven by a computer representation of the workflow logic [9]. Specifically, WfMS allows the user to define and design different workflows, like ad hoc, administration and production [25], for different types of business processes [27]. Furthermore, WfMS keeps tracking all processes simultaneously to control and coordinate workflow and information between participants to automate processes [9]. However, WfMS's limitation in functionality usually leads to actual features provided by the systems are not well correlated to the expectations from the users. For example, WfMSs support ad hoc workflows must provide functionality for facilitating human coordination, collaboration and co-decision, but such WfMSs cannot be used for workflows for controlling task ordering. Therefore, WfMS's contribution to the business performance based on the serious analysis of business processes of an organization and the corresponding workflows.

DU's current student recruiting system is partly automated. Specifically, only the online application process is automated, but not a cohesive and automatic

TABLE III.   IMPORTANCE MARK FOR THE VALUABLE ATTRIBUTES AND PERFORMANCE MARK FOR EACH INITIATIVE

Categories	Success Attributes	Mark for Importance	Mark for B2C Performance	Mark for ITO Performance	Mark for WfMS Performance
Strategic Aspect	Interrupted core business activities with website quality	5	5	3	2
	Kept traditional competitive advantages	5	4.9	2.3	4
	Improved market share track	1	3.4	4	2
	Relations enhanced competitive advantage	3	4.3	4	3
	Improved new competitors track	1	1	4.1	2.1
	Improved buyer behavior track	4	4.1	5	2
	Offered customer personalization	4	5	3	4
	Quicker timescale to market	4	3	4.9	2.2
	Good services offered by e-business	4	3.9	3.1	3
	Innovation allowed when risks are low	5	4.8	4.9	2.1
	Improved customer satisfaction	5	4.7	5	4.1
	Trained employee	2	2	5	3
	Good cost control	5	3.3	4.8	3
	Improved response to change	3	3	3	4
	Improved service quality	4	4.6	4	4.2
	Improved team work	2	3.3	2	4
	Overcome culture barriers	3	2.2	5	2
	Promote proactive culture	3	2	4.1	2.1
	Improved planning	3	3.2	3.1	3.1
	Improved administrative procedures	3	4.2	3.2	3.2
	Reduced market cost	5	3.8	4	2.2
	Leader in new technology	2	3	4.8	3.1
	Improved organizational process flexibility	5	3	2	4.2
Management-oriented Aspect	Improved capabilities understanding of technology by executives	4	4.3	2	4.4
	Support for e-business from top management	4	4.2	2.1	4.5
	Improve communication throughout the organization	4	3.1	2.2	5
	Improve communication with customers	5	4.6	4.7	5
	Improved data management	3	4.5	3.3	3.3
	Reduce paper work	1	3	3	4
	Reduce labor cost	4	3.2	4.9	3.6
	Reduce rework	2	3.2	2.2	3.2
	Improve quality of out put	1	5	3.5	4.2
	Improve ability to exchange data	3	3.1	4.8	4.3
	Improve response time to queries	4	3	4.9	4.6
	Improved forecasting and control	3	4.7	4.2	3.5

TABLE IV. ADVANTAGES AND DISADVANTAGES OF INITIATIVES

B2C		ITO		WfMS	
Advantages	**Disadvantages**	**Advantages**	**Disadvantages**	**Advantages**	**Disadvantages**
Integrating Online and Off-line business	Difficulty in measuring business performance	Gaining predictable technology budget	Critical information can be scary	Guaranteeing a concurrency system	Increasing expenditure for the increased scope
Offering personalization to customer	Highly accuracy requirement	Cost savings	Loss of a critical capability	Integrating cross-enterprise workflows	Inflexible in handing human intervention
Collecting customer knowledge	Long time development for the process	Greater access to skilled staff	Possible threat of opportunism from suppliers	Business process verification and simulation	Unpredictable scalability for the system
Managing relationship with customer	Attractive content is difficult to define	Focuses on the core products and services	Loss of flexibility	Matching workflow to organization strategy, structure	Poor communication support
Winning new customers	Relative large investment	Short timescale for development	Loss of advantages in information management	Automating resource and information management	Poor fault tolerance
Monitoring internal and competitors activities	Higher employee ability demand	Risk sharing with the technology partner	Decline performance of current employee	Coordinating and streamlining business processes	Failed components cannot be replaced easily

Recruiting system. For example, the communication Among applicants, marketing departments and academic is suffering great latency. DU's business process is highly information related and can be defined as ad hoc workflows. Therefore, WfMS guarantees a dynamic and automatic recruiting system to DU.

TABLE V. CONTRIBUTION VALUE DECISION MATRIX

Marking Rules		Number of Attributes			Value for each Attributes
		ITO	**B2C**	**WfMS**	
I=3	P=3	1	1	1	0
	P>3	8	6	6	1
	P<3	0	2	2	-1
I>3	P=3	2	2	2	0.5
	P>3	12	15	11	1
	P<3	5	1	5	-1
Total Value	B2C	1*0+6*1+2*(-1)+2*0.5+15*1+1*(-1)=20			
	ITO	1*0+8*1+0*(-1)+2*0.5+12*1+5*(-1)=16			
	WfMS	1*0+6*1+2*(-1)+2*0.5+11*1+5*(-1)=11			

IV. EVALUATION AND PRIORITIZATION

After In e-business, a well performance strategy may show little importance to the success of e-business. This indicates that the adoption of a strategy should consider both importance and performance values. Hence, this report adopts the Importance-Performance Analysis (IPA) [28] which is a tool for evaluating marketing strategies, to analyze the performance of initiatives for the important attributes of DU. Then prioritize initiatives with decision value theory [30]. The process follows these steps:

(1).Mark picked success attributes for DU in terms of importance and performance of each initiative to attributes.

(2).Draw IPA maps

(3).Calculate contribution value of initiatives

A. Marking for the Performance and Importance

Cooperating analysis of DU and success factors summary in e-business identified from the literature [6, 7, 8, 18, 30,31, 32, 33] presents the success attributes to evaluate these initiatives. The case study of [3, 7, 8, 15, 24] marks the importance of these attributes (Table. III). The review of [2, 6, 16, 17, 18, 20, 26, 27], [11, 21, 22, 23, 24] and [25, 26, 27] separately shows the advantages and disadvantages derived from B2C, ITO and WfMS to DU (Table IV), and marks the performance of them in Table. III. Based on the importance

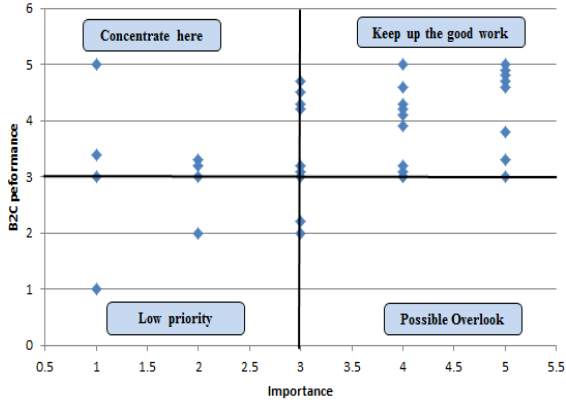and performance value drawing the IP maps (Fig .7, Fig .8, Fig .9).
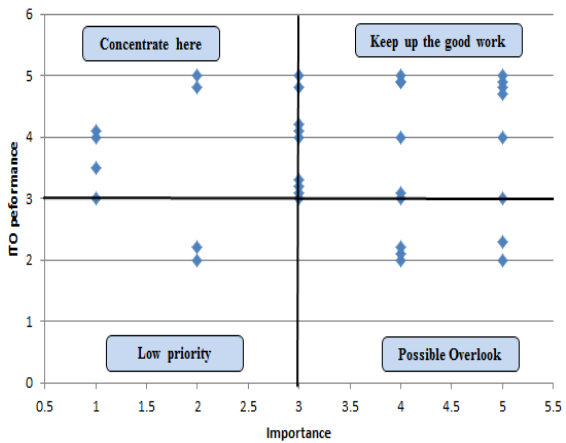

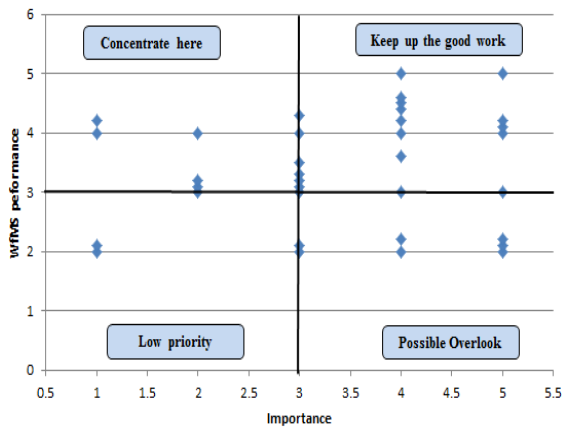Figure 7.   IP maps for B2C

Figure 8.   IP maps for ITO

Figure 9.   IP maps for WfMS

B.   IPA and Comparison of Initiatives

IPA demonstrates each initiative's performance to the importance of DU. Interpretation of the four quadrants of IPA is illustrated:

(1).Concentrate here: bad performance for the importance.

(2).Keep up the good work: well performance for the importance.

(3).Low   priority: badly   performance   for   the unimportance.

(4).Possible   overkill: well   performance   for   the unimportance.

It shows that (1) and (2) seriously reflect the contribution of each initiative for DU's importance. However, (3) shows low salience in effecting the business and (4) even states little contribution. Hence, the comparison factors especially focus on the attributes (1) and (2). Although the IPA clearly locates these attributes, the evaluation of importance-performance of these initiatives should base on decision value theory [30]. Finishing final comparison with following steps:

(1). Calculating and marking the contribution value of these attributes with following rules (I donates value of Importance, P donates value of Performance):

If	And	Mark
I=3	P=3	0
	P>3	1
	P<3	-1
I>3	P=3	0.5
	P>3	1
	P<3	-1

(2).Calculate the contribution value for each initiative, and rank them (Table V)

The calculated total value (Table V) prioritizes these initiatives as B2C, ITO and WfMS. The attributes locations of IPAs show that B2C takes the advantages of customer relationship management, risk reduction and strategy flexibility. ITO shorts marketing development lifecycle and saves cost, WfMS extremely enhances the execution of organization. This demonstrates that DU should firstly focus on CS, then boost the productivity to China market and finally improve organizational management to support the e-business.

C.   Limitation

The importance and performance are marked by predication that based on literatures. These mark maybe not accurate enough. Then, the contribution values are marked by widely divided range of I and P, should value them more seriously. But the outcome of the evaluation is reasonable to DU.

V. CONCLUSION

What E-business is widely adopted in education market enables universities to recruit the most able and motivated students and staff across the world, so as to improve the education and research level and boost financial budget. While create a successful collaboration between business strategies and supported technologies is composure for e-business adoption. Hence, firstly analyzing both the internal and external environment for DU to identify its current capabilities and resources to support its core business goals. Then picking B2C, ITO and WfMS to attain its customer relationship management, global cooperation, cost saving and motivation of internal working mechanism. The IPA and decision value theory prioritizes these initiatives as B2C, ITO and WfMS. The evaluation results also indicate that each initiative takes advantages in a typical field; e-business success should base on the cooperation of them, or proposed a comprehension initiative to model different advantages simultaneously.

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