Digitally enabled interactions: Designing for Customer Agency, Control and Customization

Dr Steve Pearce

School of Management
University of Bristol
Bristol, UK
steve.pearce@bristol.ac.uk

Abstract— **Designing service processes to receive digital inputs from customers is a key challenge for service providers. This design has an impact on the outcomes of the service process for the provider and customer. These impacts can be customization, control, and customer agency. Service process activities receive customer information digitally through surrogate interactions using customer and provider digital technologies. These digital interactions are becoming the dominant method for obtaining customer resources and information to provide service. A design of learning processes to achieve customization and control is illustrated to show how these outcomes provide customer agency and satisfaction. Traditional service design challenges and trade-offs are mitigated through designing services for digital interactions**.

Keywords **- Service Design; Service Processes; Unified Service Theory; Process Chain Network, Customization; Control**

I. INTRODUCTION

Services are defined by the Unified Services Theory (UST), as "Services are production processes that act on or with customer resources" [1]. The customer resources are the customer's self, belongings, and/or the customer's information. Customers input these resources using their mobile devices, laptops, and digital technologies. They will use their own digital devices or those designed and provided by the service provider. The resulting service process design can be shown on a process chain network diagram using a Process Chain Network Diagram (PCN) [2], Figure 1.

These can show the process steps and inputs, illustrating the service design choices. PCN's provide a methodology for service design for customer inputs to service processes, these visualize the different domains of the customer and provider, and the interactive regions in which specific process steps are placed to coproduce services. These interactive regions are direct interaction and surrogate interaction. Services are enabled by provider and customer digital technologies, typically these occur in the surrogate regions on a PCN diagram. Services are coproduced in these regions. The process steps in the interactive regions have implications for the provider and customer outcomes of services. Independent processing in each domain are not interactive process steps between provider and customer and are not services. Figure 1 shows these regions and outcomes. Using the UST and PCN to design service processes for embedded cyber physical systems provides a methodology to ensure each entities outcome are accommodated. Providers prefer surrogate interaction for digital customer inputs because of the control and efficiency outcomes [3].
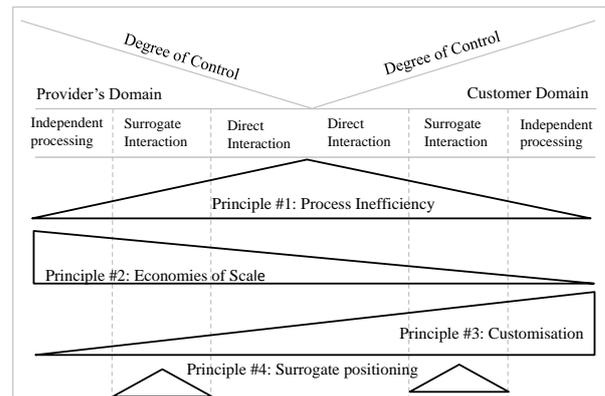

Figure 1. Process Chain Network Diagram [2]

Firstly, this paper explores customer agency, a high-level outcome of the customer. Secondly, the control needs of the customer and provider for effective and efficient surrogate interaction are discussed. Then the customization needed in service designs to meet customer needs. Finally, the outcomes of using these design principles are illustrated through an example of services design in a blended learning environment.

II. CUSTOMER AGENCY

In surrogate interaction in the customers domain, the customer becomes an agent for the provider, they use the providers process to coproduce their own service. Stakeholder agency theory [4] provides a lens to explore their behavior and motivations. The theory suggests that a contract exists between management and stakeholders and that mechanisms are used to police these contracts. In designing the service process there is often an implicit and explicit contract between customer and provider. Terms and conditions are accepted as an entry requirement before service commences, often with one click. Often customer agency is restricted, especially over their rights in relation to their information and data. In return, customer agency and use of the digital service are provided, sometimes at no cost to the customer other than their resources. Customers now experience service and interaction structured through a contract with the provider and the service process design. Essentially a series of digital encounters and cues through which customers perceive their service experience, creating touch points and journeys that the provider has planned [5]. Applying this lens can provide novel insights on the design of service process steps in providing customer agency whilst providing a design structure to meet the outcomes of the provider.

III. CONTROL

The PCN diagram illustrates customer and provider control, maximizing with independent processing steps and minimizing for direct interaction for the customer and provider. In contrasting service and manufacturing operations (independent processing in the providers domain on a PCN), it is the 'processing of customers' that creates inherent variability where service operations have lower control [6]. Some work associated with customers is uncontrollable for the provider, customers do not behave and work in the same way as an employee who is trained and under an employment contract. There is a difference between uncontrollable work and controllable work, often the presence of the customer in the service process will create uncontrollable work making scheduling difficult for service operations [7]. Hence the traditional view that the presence of the customer reduces efficiency for the provider [8]. These are operations perspectives and motivations, and customers introduce further control challenges for the service provider. This is illustrated in Figure 2 where the three agents, the service organization, the service operative and the customer interact in the service encounter. The service organization, requires efficiency, the service operative autonomy and the customer, requires satisfaction [9]. The service encounter can be characterized as three agents in tension for the control of the service process.

Moving towards independent processing will help increase control and remove variability created by the customers role and inputs. This provides more control for the service provider or customer as shown in the PCN diagram, Figure 1. This provides more efficiency for the provider more akin to manufacturing processes.
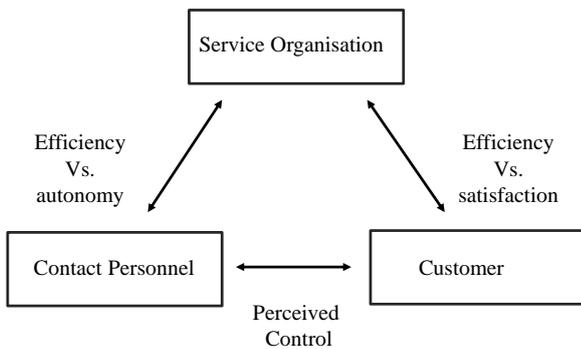

Figure 2. Service Encounter Agent Tensions [9]

However, service processes require customer inputs, controlling customer resources and inputs present a challenge for service operations businesses, often reducing efficiency. In fully digital service processes the organization and contact personnel have been replaced by technology, software, and devices where control is built into the process steps. The customer interacts in the surrogate region of the PCN achieving more control over a direct interaction process. This can create increased perception of control for the customer.

IV. SERVICE DESIGN THE SURROGATE INTERACTION IN CUSTOMERS DOMAIN

Service process design in the surrogate interaction region using digital technologies provides an opportunity for the service organization to increase control, reduce tensions, and mitigate inefficiency. The customer perceives more control over their service interaction, while providing their resources to the provider. Service interactions consequently require technology and software that connect the customer with the organizations surrogate and independent processing. This design was illustrated for a UK challenger bank Figure 3 [3].
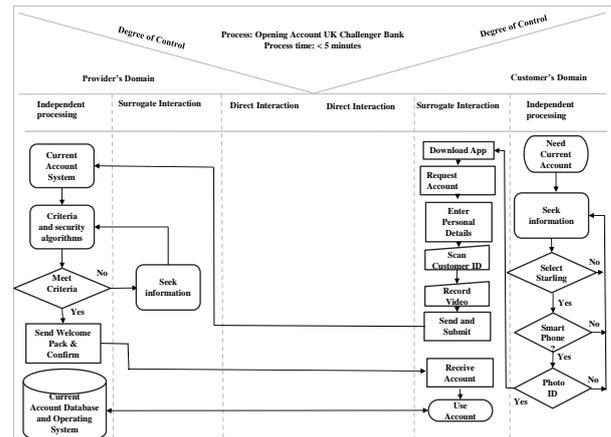

Figure 3. UK Challenger Digital Bank Process[3]

V. CUSTOMIZATION OUTCOMES

The UK challenger bank using technology and service design in the customers domain has been able to improve its efficiency over traditional banking services. This has been achieved using customer resources through self-service - service design in the customer surrogate interaction region. This provides the customer with more control and allows them to customize their banking activities. Improving the quality of the service encounter whilst reducing the cost to serve for the provider. This is termed low cost accommodation for managing the trade-off between quality of service encounter and the costs to serve [10]. Design in this region also mitigates the apparent trade-off between customization and standardization [11].

It further provides the opportunity for removing some operational limits to mass customization [12]. These long-standing and significant service operations challenges and trade-offs are mitigated by service design in the surrogate regions, providing the opportunity for more control for both the service provider and the customer. The ability to design for mass customization of service, in the case of the UK challenger bank for nearly 2 million customers, is a competitive advantage created through service process design in the customer surrogate interaction region.

VI. SERVICE DESIGN FOR CUSTOMIZATION AND CONTROL

These approaches to customization, control and agency have been applied to the learning activities of 360 International students studying digital business. Specific learning activities were designed in the surrogate regions to provide customization and choice. With the movement of teaching to online and blended, the teaching activities were

designed with significantly less direct interaction, in fact face-to-face learning was reduced to virtually zero. This is like the situation on the UK challenger bank processes that were shown in Figure 3. The learning outcomes remained the same, but the assessment and unit content and structure were changed significantly towards surrogate interaction in the tutors and student's domain. A group assessment project was designed where students were able to choose a digital start-up organization to analyze. An individual assessment activity was also linked to the start-up organization. There were over a hundred choices with organizations ranging from artificial intelligence to restaurant supply chain management.

The learning activities were designed for surrogate interaction in the student's domain. These were mini lectures available online, optional tasks and activities to activate prior learning and consolidate learning. Additionally, there was surrogate and direct interaction with peers, reflective learning journals and online access to information. Formative assessment and feedback on all learning, presentation and writing activities was provided via surrogate interaction in the tutor's domain. Students were able to customize these learning activities and had a degree of control as to when these activities took place. Mini lectures were often watched several times and learning was spread throughout the week of the release of the video and beyond. For example, Mini Lecture 1 has been viewed 626 times over two months, there are only 360 students on the unit. Students and tutors have more control over the learning because of the surrogate interaction in each domain. Tutors were able to analyze engagement on the virtual learning environment and on the video platform. Students were able to control the time of their learning, repeat learning and customize learning relevant to their assessment organization or personal learning interests selected from the range of content available in the unit. Figure 4 illustrates the learning activities on a PCN diagram in the surrogate domains.
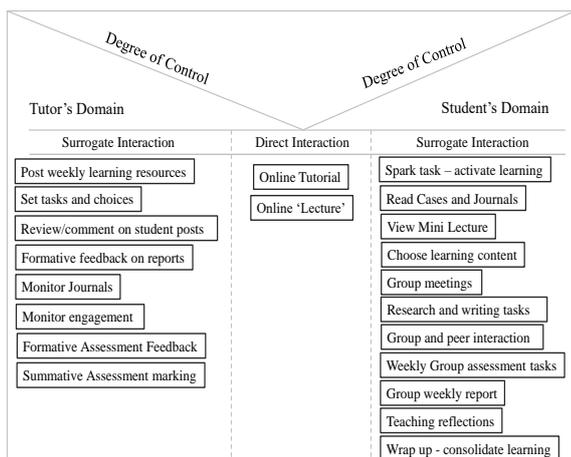

Figure 4. Leaning Activities on a PCN

Student engagement with learning, assessment and with peers showed positive improvements on previous unit designs that involved direct interaction. Providing more control and choice allowing for customization of learning. Reviewing reflective journals and group assessment presentations showed students engaged more widely with theory, practice, critical thinking, and analysis. Tutors were able to concentrate on formative feedback, monitoring

engagement and ensuring students reflected on the appropriate content relevant to the organization they had chosen and the learning outcomes. Students' evaluation showed the redesign of the unit have improved their satisfaction. Students evaluated the unit design as good or excellent in a midterm survey, all respondents rating the unit above 4.5/5. The teaching team received many positive feedbacks on the experience and learning design. Examples of feedback from students on their learning and the unit design.

> *"I really enjoy the group work in the unit. Because it has a group journal and feedback to ensure everyone contributes to the work."*
>
> *"Feedback of group journal is helpful. I really like the weekly group journal part; it pushes me to complete my weekly studies in a timely manner. Especially in this particular situation now"*
>
> *"A lot of effort has been put into making this module which shows through the different methods of learning we are given."*
>
> *"The course is rich in content. Mini-lecture and tutorials are very useful. Weekly group meeting is a little bit challenging, but I enhance my teamwork and communication skills through this activity."*
>
> *"The ongoing updates in analyzing the current environment and social relationship of the company is interesting. It is like digging for treasure."*
>
> *"I have had a clear understanding about how to analyze a business model canvas, it is helpful for me to know more about a new company."*
>
> *"The group work is fun, and I like it so much. I never have such good experience and discuss with group members every week, which help me gain good friends and comprehend knowledge better. Also, the simulation of group work is fun."*

VII. CONCLUSIONS

Designing services in the surrogate interaction zone increases control for the customer and provider. Customers have more agency in the blended learning example, a more flexible learning contract between the University and the student exists. The provider gains efficiency, mini lectures are designed and can be reused many times, with minimal further resource inputs by tutors. The customer gains more control, students are able to control their learning times and content relevant to the own learning activities and needs. The service can be mass customised to the specific needs of individual customers. Students had choice in the content, assessment, learning periods and learning with peers. More control and customisation can improve customer satisfaction, the service provider gains more control.The service performance can be digitally evaluated, often in real time, enabling timely interventions to ensure service quality. Traditional service design challenges and trade-offs are mitigated through designing services for digital surrogtae interactions .

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