

16 Technology, Innovation and supply Chain Management
Interactive Session

Value Chain Management within Tertiary Education

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ABSTRACT: *Competition for resources, funds, and especially for students has become increasingly fierce (Kretovics & Michael, 2005) in the tertiary sector. Establishing integrated value chains could provide a significant advantage (Bojan & Pavlenko, 2014). This research focuses on the applicability of value chain management within tertiary education and conducts a case study investigation of a New Zealand University. A conceptual model is developed that synthesizes the advantages of value chain management principles for enhancing tertiary education service chain performance. The findings demonstrate the adaptability of value chain management practices in the tertiary education service sector. Significant improvements to education provision are feasible, however long held viewpoints and divergent agendas will first have to be tackled.*

Keywords: value chain management, case study, tertiary education, student service provision

Most universities continue to struggle with the competing yet overlapping commitments to teaching and research (Malcolm & Tarling, 2007). Managing complex Tertiary Education Institutions (TEI) has become more challenging and unpredictable, and therefore requires tailored strategies and management approaches (Christopher, 2011). It is akin to managing extended service chains with high uncertainty, such as academic policy issues, unforeseeable and unstable foreign currency exchange rates, hidden costs and unexpected risks, all of which undermines the revenue generated from enrolments and grants (Jones and Robinson, 2012). Malcolm et al. (2007) highlight the difficulties universities face in capturing, retaining and building reputation and student recruitments. Arguably it requires an integrated, collaborative, flexible, resilient and value-generating system to enable efficient and effective management and operations (Malcolm et al., 2007). Creating this integrated service value chain that can manage internal and external service chain relationships is vital to TEIs in a long run (Bojan et al., 2014). Value chain management can provide organisations with a competitive advantage and assist them in achieving their business and manufacturing goals (Kuzdowicz, Vidova & Witkowski, 2013). This research, by adopting a case study research method, proposes to investigate whether and how value chain management theory is applicable to education provision in the tertiary education sector.

This is the first attempt to explore the overall of value outcomes within tertiary education. It will fill a relevant gap in the literature by presenting an empirical comparison of the perceived value outcomes of several tiers of a tertiary education service chain (Lindgreen, Maon, Sen & Vanhamme, 2013). The anticipated outcome of this research is to construct a new conceptual model of value chain thinking, aligned with the objectives of tertiary education institutes, in order to enhance the service quality (Bull & Wahl, 2013). Theoretically the research aims to contribute towards our understanding of value chain management and whether it can be applied to the service sectors.

LITERATURE REVIEW

Value chain management is a cross-boundary system, aiming at eliminating non-value-added processes, and driving each individual chain to generate value (Christopher, Gimeno & Oliveira, 2014a). The focus of value chain management is the value generated throughout each link of the whole chain once delivered to the end users, by means of effectively managing its supply chain network, aiming at seeking endless improvement to achieve perfection (Kuzdowicz et al., 2013). An integrated value chain management system is one of the most competitive strategies for organizations (Christopher, Gimeno & Oliveira, 2014b). Although supply chain management helps firms improve performance to better serve its customers, value chain management enables a firm to exceed customers' expectations with value-added and customer-centred service (Emmett, 2008).

Organizations no longer compete, their service value chains do (Christopher et al., 2014b). Table 1 identifies ten key value chain management practices, ranging from lean thinking to relationships management. Common themes are the focus on value from a customer's perspective and the removal of non-value adding processes, together with integrated information systems and the development of win-win scenarios.

Insert Table 1 about here

Value chain management implementation requires mind-set change to break down existing barriers in planning, processes, people, customers, commitment, culture and communication (Oaklan,

2003). The typical tertiary educational obstacles include bureaucracy, management style, inefficient operation, unsatisfactory teaching and learning outcomes, internal conflicts and competition (Harris et al., 2010). A number of barriers, such as unfamiliar policies, cross-functional administration, information systems, communication infrastructure and business barriers challenge the running of tertiary education institutions (Goodman et al., 2012). In summary, the major impediments typically consist of strategic, managerial, financial and operational constraints (Kretovics et al., 2005).

A conceptual model, correlating value chain management principles with the tertiary education context has been developed, Figure 1. The value chain management perspectives outlined in Figure 1 encourage an integrated approach modelling flows of the value streams generated at individual chains within tertiary education, by focusing on the area of operation and service (Bull et al., 2013).

Insert Figure 1 about here

Although there are numerous books, papers and journals discussing the application of value chain management in various businesses, there are very few that focus on the service sector (Malcolm et al., 2007). Even fewer still cover the adoption of value chain management within tertiary education (Kuzdowicz et al., 2013). This is the first paper to attempt to provide an overall view of value outcomes within tertiary education. It fills a research gap in regard to verifying if value chain management theory is applicable to tertiary education and transferrable to other service sectors.

DATA ANALYSIS

The empirical data was collected from a single university case study within New Zealand, hereafter named the University. Data collection took place in three phases: Task-oriented focussed interviews with general staff, face-to-face in-depth interviews with academic staff, and thirdly archival data collection from the University's records (Allen et al., 2012). Analysis approaches involved interpretation, comparison, conversation and content analysis (Cooper & Schindler, 2011).

By means of process mapping, this study identified value, essential non-value and non-value processes relevant to core service delivery (Bourlakis et al., 2012). This comparative analysis between various stages of the value chain map provided insights into the case University value-creating activities and areas for improvement (Harris et al., 2010). The case study University was selected due to its long history, high standing and strong emphasis on international programmes thus providing a comprehensive example. Data collection took place by interviewing both general and academic staff, who are involved with students' pre-study enquiry, admission, assessment, enrolment, orientation, academic programmes, academic support and career services.

This paper examined how University served its students particularly in the area of admission, enrolment, academic and support service, whose functions served to bring in new students, as well as building up the international reputation for University (Bastedo & Bowman, 2009) and of course sources of revenue. The interviews were structured according to themes including drivers and barriers, values and wastes, collaboration and integration, performance measurement and information system as per the previously highlighted principles of value chain management in Table 1. Based on the interviews and archival data, process maps were developed for the core University functions, see Figure 2 for an example. These value chain maps identify non-value, essential non-value and value adding processes, as highlighted by the colour symbols in Figure 2.

Insert Figure 2 about here

Standard applications from international articulating partners take 2-3 weeks to be processed, due to multiple layers of procedures. However non-standard applications take 4-8 weeks to process due to the lack of delegate approval and the involvement of multiple decision makers. During the actual student's study, academic service was identified as the core value-adding service.

The interview data covered aspects from admission to career service support. In the empirical qualitative work, key items were examined. The interview data highlighted issues within enrolment and academic service, as well as university functional silos impeded service quality. Three key themes were identified: information, process and people. Table 2 compares service lead-times and identifies potential actions to enhance enrolment turnaround.

Insert Table 2 about here

Workforce motivation, management competence, performance measurement and reward systems were the areas causing the most significant issues. Critical value-added services included quality academic services, reputable qualifications and graduate employability. Essential non-value elements covered collaboration, information system tools, a committed workforce, and value-based payment systems. Bureaucracy and insufficient management training were identified as the major causes of waste.

FINDINGS AND DISCUSSION

Reflecting on our original conceptual model (Figure 1) in the light of the empirical data brings to the fore three broad concepts. Firstly is the students' experience, which relies on cross-functional and cross-organizational collaboration enabled via integrated and intelligent information systems and responsive communication channels. The second concept is operational excellence, which enables efficient and effective services to students. The third concept is value-based and customer-centred performance measurement systems, which provides a clear agenda and motivation for a committed workforce and enables sustainable quality tertiary education services to students.

This study highlighted the importance of an integrated and visible service chain by eliminating non-value processes in order to make the process shorter, leaner and swifter, as espoused by Antony et al. (2015). Interviewees agreed strong connection and interaction were vital to enable an excellent tertiary education service, which reinforces the argument of Balzer et al. (2015). Fuzile (2015) concluded lean and uniform procedures are required to achieve operational excellence, which was one of the main findings of eliminating operation waste, simplifying and standardizing processes. Walden (2006) predicted tertiary education institutions lose velocity and flexibility because of their excessive layers of management and procedure and associated complex, and our findings are very much in line with the assertion. A key issue identified in our study was the lengthy service time, inefficient communication and disjointed service chains, due to lack of intelligent and integrated information system and transparent communication channels, which is in line with Balzer et al. (2015) arguments.

Based on the empirical data, quality teaching service was seen as a key value adding process in the tertiary education value chain, which affirms prior work by Forcellini et al. (2014). Deloitte (2008) identified four quality academic services:

1. reliability and approachability of academic staff, and
2. timely and quality feedback on students' study progress, and
3. practical and internship-focused courses and programmes, as well as
4. accountability of students' learning outcome,

The academy staff in our study further endorsed these four attributes. Based on the responses, effective teaching appraisal and assurance systems would efficiently monitor teaching service and regularly oversee the service delivery of academic staff, as per prior work by Stephen (2009). One of the key findings was that to have customized total quality management system in place to enable quality academic and non-academic services, as observed by Oakland (2003).

The study explored workforce commitment to value chain management practices and found these to be a critical component of tertiary education service provision, which was endorsed by Balzer et al. (2015). Malcolm et al. (2007) emphasized that a salary package focused on contributions and values could enable productivity, motivation and commitment of the workforce, which was one of the major results in our study. Snee (2010) found poor leadership and mismanagement were two fatal factors to workforce commitment, attributes of which were identified in our study. To adjust research-outcome-focused to teaching-outcome-focused promotion system and set up value-based reward system to drive both academic and general staff creating values for organization were conveyed in the study, as collaborative, committed and cohesive workforce were the biggest values for an organization (Malcolm et al., 2007)

Lacking a sense of belonging and experiencing alienation by some respondents was a concern, since strong collaboration, connection and embracing diversity enable sustainable quality service and are essential to the unity of an organization (Malcolm et al., 2007). The responses substantially reflected short of transparent communication and supportive connection between academic and professional staff, as examined by Antony et al. (2015). Tertiary education value chains are complex,

thus making it difficult to establish strategic alliance relationship with all chain members external and internal despite the promotion of such by Balzer, et al. (2015).

This paper investigated how university served its students particularly in the core services related to service excellence and chain members' wellbeing. However, due to unwillingness or uncertainty about the motivation of this survey, a certain number of targeted staff did not respond to the interview request, which made the qualitative data somewhat incomplete. Due to research ethics, feedback from students was not included, which naturally limits the validity of our findings.

Whilst this work provided key information about the applicability of value chain management to tertiary education, the research only looked at a single university case. Therefore it requires extending to incorporate other educational providers and their partners. Further research might also explore similarities and differences of service chains in different countries and other types of educational institutions. Longitudinal studies into the implementation of value chain principles in this sector would yield valuable insights into the barriers and enablers to value creation from an education perspective.

CONCLUSION

Bojan et al. (2014) observe universities are increasingly aware that when students weigh the pros and cons of tertiary education, they value more than affordable tuition fees. The requirements for both collaboration and value-creation lead to the consideration of feasibility of applying an integrated value chain management approach to tertiary education (Kretovics et al., 2005). This paper examined how universities serve their students and explored how value chain management could be applied to educational providers resulting in enhanced service quality. Given the service and educational context, the research highlighted a number of adaptations required to value chain management principles in order to align the approach to this new environment.

The key findings have been categorized into three areas, which are process, information and people. As capturing, retaining and building up recruitments becomes more challenging, these areas require an integrated and value-adding focussed system to enable efficient and effective service

delivery (Malcolm et al., 2007). This research verified that compatible and adjustable value chain management practices are applicable to tertiary education service chain in helping providers achieve sustainable tertiary education excellence. The study demonstrates how value chain management principles are applicable and adaptable to this new context (Antony et al., 2015; Balzer et al., 2015 & Bojan, 2014):

The application of value chain management could lead to the use of lean and agile tertiary education service system that has the potential to enable a one-stop service through quality academic service systems with efficient and effective teaching and support. Further, intelligent and integrated information system with trackable and transparent communication channels could become the norm if value chain principles were applied in the TEIs.

This paper is the first of its kind to study the applicability of value chain management to tertiary education. It is hoped that it acts as a catalyst to further investigation of value chain management within higher institutions and other service sectors. The objective of this research is to contribute towards our understanding of value chain management applicability and transferability to the service sectors. Further research on the impact and implementing of value chain management in this novel context has the potential to offer guidance to practitioners, professional and academic staff, as well as decision-makers operating in the education sector. Inclusion of the inter-play with the research agenda of universities is required in further studies.

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Table 1: Potential Attribution of Value Chain Management to Tertiary Education Service Chain

Value chain management practices	Potential attribution to tertiary education service chain	Sources
<p>Lean thinking</p> <p>(to thoroughly eliminate waste, by means of lean tools as well as to remove any non-value-adding activities or resources or processes, in order to enhance operation performance and create lean organization)</p>	<p>It enables lean management by reducing college-level management and operation, while empowering its main revenue-generator, namely its school to act in an “entrepreneurial” way, in order to resiliently respond to volatile market disciplines and forces.</p>	<p>Balzer, Brodke and Kizhakethalackal (2015) and Antony, Douglas and Douglas (2015)</p>
<p>Agile service</p> <p>(to make organization react quickly, adaptably and swiftly to customer-driven markets with responsive and resilient service)</p>	<p>1. It shortens application, assessment and enrolment process length in tertiary education service chain.</p>	<p>Antony, Fisher, Francis and Thomas (2015)</p>
	<p>2. It gets rid of bullwhips and bureaucracy effects, provides responsive and deliverable service to its customers.</p>	<p>Forcellini, Forno, Kipper and Pereira (2014)</p>
<p>Total quality management</p> <p>(to enable organization to achieve continuous operation and service excellence and innovation)</p>	<p>1. It enables quality service, which is the key to achieve sustainable tertiary education service excellence.</p>	<p>Cagliano, Caniato and Spina (2006)</p>
	<p>2. It enables assets return to be forecasted and values to be added with quality service and marketing timing techniques.</p>	<p>Marshall, Rose and Young (2015)</p>
	<p>3. It drives tertiary education service to do good, better and best to exceed the expectation of its students and customers.</p>	<p>Stephen (2009)</p>
<p>Enabled and integrated information and communication system</p> <p>(to be the enabler of internal and external collaboration and consolidation)</p>	<p>1. It enables on-line and paperless teaching and learning, which makes education more flexible, accessible and affordable.</p>	<p>Bojan et al. (2014)</p>
	<p>2. It delivers e-application and on-line paper enrolment, which makes processes more efficient and effective.</p>	<p>Goodman and Miller (2012)</p>
	<p>3. It speeds up monitoring and tracking inbound and outbound logistics of students.</p>	<p>Harris and Holley (2010)</p>
	<p>4. It enables responsive and spontaneous communication.</p>	<p>Clampitt (2013)</p>

<p>Integrated risk management (helping organization make current and future decision sophisticatedly in order to enable a reliable service chain.)</p>	<p>1. It efficiently manages business risks onshore and offshore, by means of collectively predicting, identifying and mitigating new and potential risks.</p>	Reuvid (2012)
	<p>2. It enables higher institutes to forecast and mitigate financial risks, such as pressures on inflation rates, exchange rates and new taxation rules swiftly.</p>	Reuvid (2012)
<p>Collaborated marketing (by collaboratively working with its business partners in design and carrying on consolidated marketing projects)</p>	<p>It enables effective marketing with synchronically branding and consolidated differentiating, to make marketing projects more productive and economic.</p>	Allen, Brady, and Walker (2012)
<p>Effective performance measurement system (identifying, developing and prompting best practices leading to overall superior performance, instead of sub-optimization)</p>	<p>1. It monitors each component's performance in tertiary education service chain, aiming at achieving efficient and effective management and operation, as well as sustainably satisfactory service.</p>	Shah and Ward (2007)
	<p>2. It drives key benchmarking to focus on identifying, developing and promoting best practices leading to overall optimization instead of sub-optimization.</p>	Garnevska, Marr and Moazzam (2012)
	<p>3. Co-designed measuring and integrated tracking system prompt accountability to all chain members.</p>	Cohen and Roussel (2013) and Thrupp (1999)
<p>Strategic alliance relationship management (increases interaction of all value chain members and enables a cross-organizational enterprise)</p>	<p>1. It increases certainty on customers' demand and enables an integrated tertiary education service chain with adoption of collaborative and strategic planning at the outset.</p>	Bourlakis, Maglaras, and Fotopoulos (2012)
	<p>2. It enables institutional, infrastructural and people-to-people connectivity, ensures tertiary education service chain to perform resiliently and reliably in a long run.</p>	Christopher et al. (2014b)
	<p>3. It improves consolidated risk and emergency management, as well as enables long-term coordination.</p>	Mollenkopf, Stolze, Tate and Ueltschy (2010)

	4. It enables customer-centric tertiary service value chain by applying joint-design and co-delivery of university products and service, home and abroad.	Thrupp (1999)
Workforce commitment (to enhance motivation, innovation and productivity)	1. It discovers that dedicated and professional ground-floor staff, as well as responsible and committed academic staff are the cornerstone of tertiary education service chain.	Angelis, Conti, Cooper and Gill (2011)
	2. It encourages long-term professional development programme to workforce, as well as value-and-outcome based salary and reward system.	Malcolm et. al. (2007)
Consolidation, collaboration and cooperation (enabling cooperatively and efficiently monitoring flow of materials, information, service and finance in management and operation)	1. It reduces overall service chain operation expenses and enhances customer service, as well as enables strategic value chain alliance.	Childerhouse and Towill (2000)
	2. It enables collectively valued, innovative and customized products and service.	Malcolm et al. (2007)
	3. It enables synchronized marketing, integrated planning, consolidated mobilization, as well as cross-boundary cooperation, which leads to sustainable tertiary education service excellence.	Chan (2007)

Table 2: Comparison of Service Lead-Time of Processing Application and Enrolment

Service category	Student category	Service lead time
Standard application and enrolment	International cohorts and individual international student of undergraduate level	Total about 3-4 weeks
Standard application and enrolment	New domestic and returned international students of undergraduate level	Total about 3-4 weeks
Non-standard application and enrolment	International cohorts and individual international student of postgraduate and master level	Total about 4-8 weeks
Non-standard application and enrolment	New domestic and returned international students of postgraduate and master level	Total about 4-8 weeks

Figure 1: The Application of Value Chain Management to the Tertiary Education

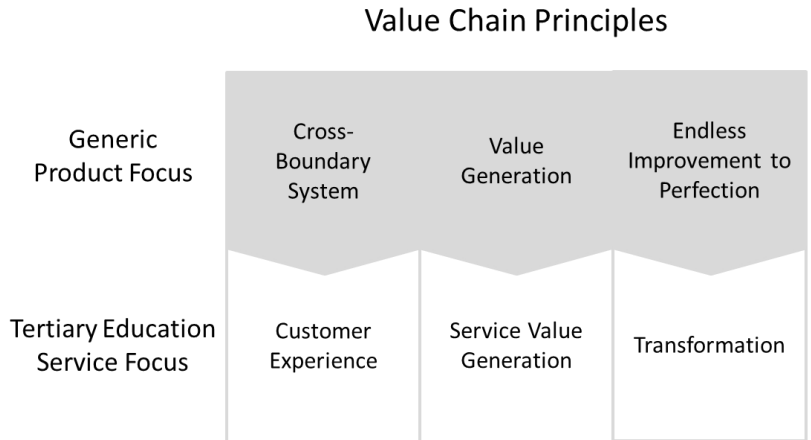
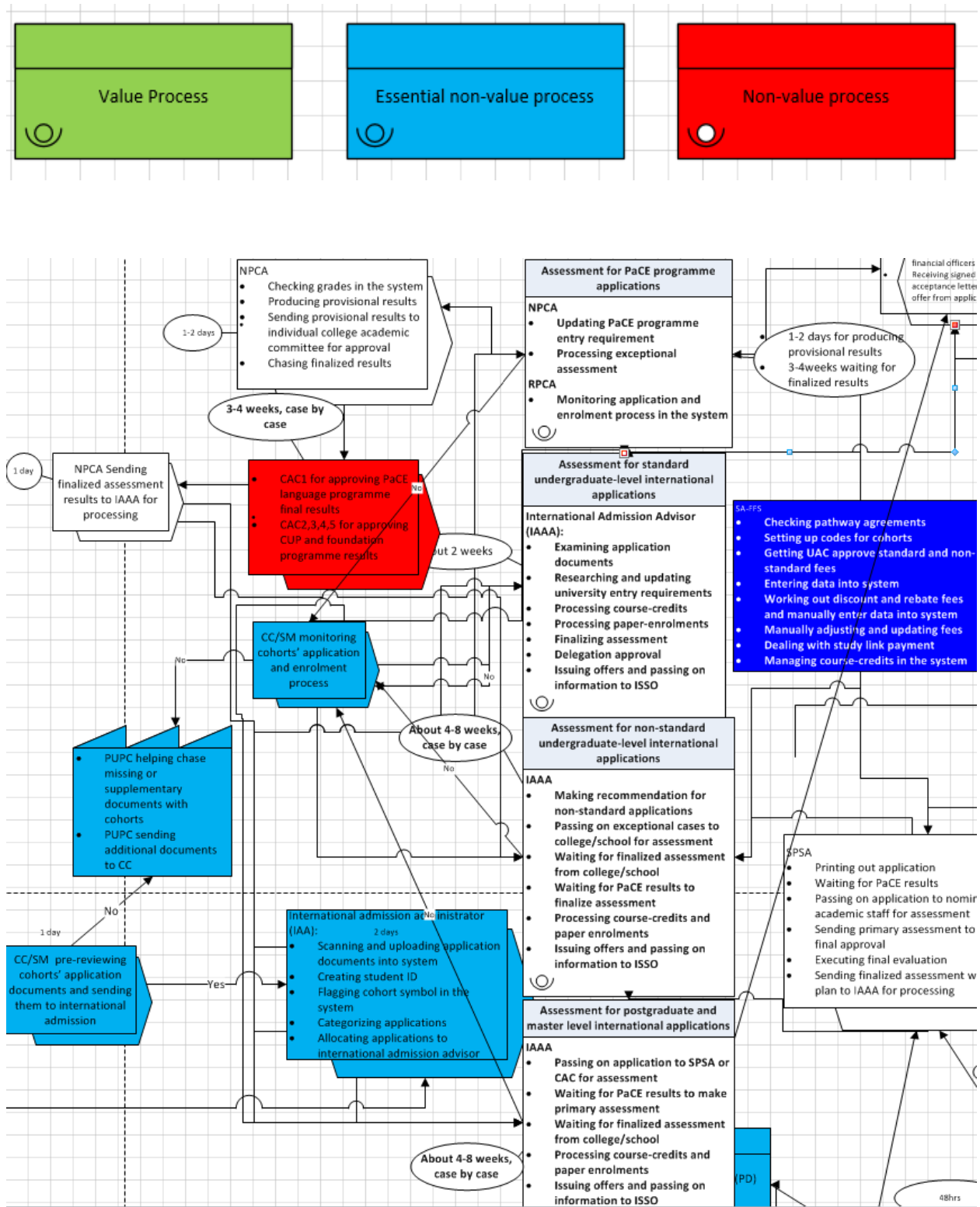


Figure 2: International Students Application, Assessment and Enrolment Processes



Note:

- NPCA=national PaCE programme administrator

- RPCA=regional PaCE programme administrator
- IAAA=international admission advisor
- PUPC=partner university programme coordinator;
- CC/SM=cohort contact/student mobility
- CAC=college academic committee
- ISSO=international student support office
- SPSA=school programme support administrator
- SA.FFS=student administration, fees and financial support
- UAC=university academic committee