

Research on the Reconstruction of Job Competencies for Digital-Intelligent Finance and Business Positions in the Context of Hainan's Customs Closure and Industrial Upgrading

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Abstract: With the closure of Hainan Customs' operations, the development of the regional industry in cross-border trade, offshore trade and digital-intelligent trade is accelerating, and now there is an urgent need to change the competency structure of finance and business positions. In light of the trend of industrial upgrading in the construction of the customs union, this paper studies the reconstruction logic of job competencies for digital-intelligent finance and business positions. Systematically analyze the deconstruction boundaries of traditional finance and business competency dimensions, the sudden changes in competency characteristics due to digital-intelligent embedding, and the moderating effect of the customs closure environment on factor weights. It can also show the transmission path of cross-border data flow, the structure of offshore trade, the restructuring of the industrial value chain in the migration of finance and business functions, conflicts among accounting and risk control capabilities, and the gradient of multi-skilled competency. Based on the above, the following three general reconstruction paths are proposed in this paper: Division and Combination of Capability Units according to the Granularity of Tasks; Adaptive Calibration Mechanism for Dynamic Competency Thresholds; and Topological Optimisation of the Competency Map for Digital-Intelligent Finance and Business Positions. Then it will construct a modular, iterative model of competency adaptation. Establish the basis and relevant indices for setting the required standards of finance and business staff in the customs clearance system.

Keywords: Digital-Intelligent Finance and Business, Competency Reconstruction, Customs Closure Industrial Upgrading, Separation of Capability Units, Topological Optimisation.

Introduction

With the increase in cross-border capital flows, the normalisation of offshore transactions, deep integration of digital intelligent systems in the customs clearance environment, etc., the traditional structure of finance and business competence based on the accuracy of accounting has shown systemic deficiencies. Most of the current research on competencies is based on fixed job descriptions or general competency dictionaries, and it does not consider the non-linear changes in the weight of competency factors and dynamic changes in the granularity of tasks in customs clearance. Therefore, it is necessary to re-examine the composition of competencies for positions in digital-intelligent finance and business at the three levels of the evolutionary mechanism, impact effect and reconstruction path. Divide the borders and mutation features of the traditional competency dimensions, set criteria to distinguish between retained, stripped and newly acquired abilities, etc. It can be seen that cross-border data flow and offshore trade have changed the migration of finance and business functions, and also caused capability tension. Next, we will present a reconstruction model based on modular assembly, adaptive threshold calibration and topology optimisation. Industrial upgrading under the customs closure is not a modification of business; rather, it is a fundamental change in the logic of finance and business operations, and according to the old system, there will be a structural mismatch between job competencies and business demands.

1. The Evolutionary Mechanism of Competency Factors for Digital-Intelligent Finance and Business Positions

1.1 Deconstruction Boundary of Traditional Finance and Dimensions of Business Competency

The scope of the competency for traditional finance and business positions includes accounting accuracy, regulatory compliance, financial reporting, etc., and the boundaries are fixed business rules and periodic reconciliations. The first task of the competent staff in a closed-loop business system will be to record and collect transaction data; they do not need to handle unstructured data at the front end. Based on the above division, there should be an organised order for the flow of business documents and a single-link chain of decision-making; otherwise, when the external environment changes, the original competency dimensions will be too rigid. The reason for breaking this boundary is that, given the environment of customs closure and the accelerated flow of cross-border factors, the original closed-loop accounting system has been disrupted; thus, Finance and Business Positions need to add new attributes of data governance and process analysis and redefine both the starting point and the ending point of competencies.

Decomposition of the competency structure should separate the main parts of the traditional division from the peripheral parts in a deconstructed manner. The main items of retained earnings are the release of regulatory and tax information, and marginal stripping refers to several accounting treatments in accordance with the rules. The Goal of the Strip is to build an intelligent digital system that can operate without people. At the same time, there is also a fuzzy region in the extension of the boundary that covers activities that are neither traditional accounting nor analysis, such as cross-system data reconciliation and abnormal transaction tagging. Now these activities are no longer confined to a single area of competence but have become intersections of old and new competencies. A clear division of the deconstruction boundary will not lose some functions and can keep the other advantages for later use.

1.2 Sudden Changes in Competency Characteristics due to Digital-Intelligent Embedding

The spread of intelligent financial systems, automatic reconciliation platforms, real-time reporting tools, etc., in the workflow of finance and business operations are typical examples of the application of digital intelligence. Therefore, the idea of competence has changed from "confirmation after the event" to "observation during the process" and from "manual adjustment of accounts" to "establishment of rules". The first kind of sudden change is in the structure of cognitive load; finance and business staff no longer need to memorize a large number of account codes and operating steps, but rather need to learn how the system works and manages data. It should not be added to the list of skills; rather, it is an adjustment in the form of ability, and some weights of the original competencies have been reduced to zero, while new attributes, such as abnormal pattern recognition and cross-system deviation tracing, have risen rapidly in importance and become necessary indicators.

The second kind of sudden change is the joint occurrence of dimension compression and dimension emergence in competency attributes. A reduced-volume function is usually low in value addition, such as manual voucher preparation and paper document archiving, whereas a new-volume function is data lineage tracing, digital-intelligent rule verification and cross-module process connection diagnosis. Given the new characteristics mentioned above, finance and business staff need to be able to think abstractly and link business events with transactions in the system. With the closure of customs and the upgrading of industry, cross-border trade has increased significantly, and now it is common practice to compare system logs with business logs; thus, the required skills are moving further away from accounting subjects towards "metadata understanding" and "digital-intelligent logic verification". Therefore, based on the above, the focus of the set of characteristics is no longer on accounting subjects but rather on the integrity of the data link^[1].

1.3 The Moderating Effect of the Customs Closure Environment on the Ranking of Factor Weights

The new business environment of customs closure has brought about new factors, such as cross-border capital flow, offshore settlement rules and multi-currency accounting, and thus the relative weights of all competency factors for finance and business positions have shifted. Decrease the original high weights of the voucher review and account summary functions, increase the weight of cross-border transaction identification and analysis of exchange rate fluctuation sensitivity, and add offshore account reconciliation. Moderation is a change in the position of factors; some abilities that

were at the limit in a closed environment, such as multi-source data matching, are now considered to be necessary indicators of the times in the era of customs closure. This is because, after the closure of customs, the business and capital flows have been further separated, and the traditional logic of document-based verification cannot cover the chain of cross-customs-zone transactions.

A change in the interaction weight of a competency factor is also regarded as a kind of moderation effect. If the customs office is closed, the warning information produced by the digital-intelligent system should be promptly reviewed for business rationality by the finance and business departments, and thus a high-weight link needs to be established between the ability to analyse data and the assessment of risk. At the same time, the weight of single-operation speed has been reduced and most of the execution-level tasks have been centralised in the system. The rank of the competency factors is no longer the linear order of "accounting-audit-reporting"; instead, it has been rearranged according to the closed-loop sequence of "anomaly identification-link tracing-rule correction". Moderation refers to changes in the weight given to competency factors based on the level of transaction complexity and the threshold for system anomalies, and it is not fixed by job descriptions^[2].

2. Impact Effect of Customs Closure Industrial Upgrading on the Competency Structure of Finance and Business Positions

2.1 The Migration of Finance and Business Functions in the Process of Cross-border Data Flow

Cross-border data flow will break down the information silos in the company's financial system and be distributed among all parties to the payment and customs process. Therefore, the functions of finance and business have expanded from the closed accounting of internal ledgers to the supervision and verification of cross-system data interface. In the environment of customs closure, the data for capital flow and goods flow will no longer be carried over via the same intra-domain link, and the first direction of functional migration is the introduction of cross-border message parsing capabilities. Finance and business staff need to know which field in all the data standards is mapped to it and trace accounting discrepancies caused by transmission delays or missing fields; thus, the original voucher-based audit function has been moved to the mid-stage verification link of the data pipeline.

The second kind of functional migration is the establishment of data sovereignty borders and the construction of internal management. The Customs Zones have different Data formats, encryption requirements and retention periods, and the finance and business departments need to store their own account information in accordance with all these various rules. The migrated function does not need to cover all the data in detail; instead, it will set thresholds for the important links and automatically add anomaly tags. Therefore, the Finance and Business staff will no longer be data-entry workers but will be responsible for setting up the rules of data linkage, and their new competencies will include protocol knowledge, interface log analysis and cross-system timestamp alignment. The first kind of functional relocation is that both the forward relocation and the backward relocation occur at the level of finance and business process nodes; the front end will be responsible for designing data standardisation, and the back end will automatically receive the discrepancy report generated by the system.

2.2 Tension Between Accounting and Risk Control in the Offshore Trade Model

In the pattern of offshore trade, the flow of contracts, goods and funds are all separate paths both inside and outside the customs area, so the traditional accounting logic based on the integration of these three flows cannot be applied. Accounting needs to solve the problem of the mismatch between the actual location of order information and settlement documents, and finance and business staff need to create a virtual transaction image as the basis for bookkeeping. There is a trade-off in the Design of this accounting method and risk control: Although it can fully and accurately record transactions in terms of amount and time, it is not very good at identifying risks from counterparties or ensuring the legality of capital flow. If there are no physical logistics documents for the offshore transaction, the original vouchers issued by the accounting department will be replaced with electronic contracts and payment instructions; thus, the traceability of risk control will be reduced, and these two have conflicting demands^[3].

The form of the problem is the division of ability orientations. The accounting department will be more willing to use standardised electronic data packages and record them directly for the sake of processing efficiency, but the risk control department needs an anomaly score for each link in the offshore transaction and several independent verification clues. Both the Finance Department and the

Business Department need to be involved in the quick booking and detailed verification steps of this process, so there will be more frequent logical switches for staff. To reduce the capacity tension of the system, rule layering is used; that is to say, low-risk transactions will be automatically directed to the fast-track accounting channel, and high-risk transactions will need to be manually verified. Therefore, the finance and business staff need to be able to set a certain level of risk and not only handle accounting work.

2.3 Reshaping the Gradient of Multi-skilled Competencies through Reconstruction of the Industrial Value Chain

Due to the customs closure, the industrial chain will no longer be a single-area linear extension but rather a modular cooperation among customs zones, and thus the multi-skilled competency gradient of finance and business positions will be altered. The original gradient is a pyramid shape, and at the bottom is financial accounting; in the middle is tax processing; at the top is report analysis. Chain reconstruction has been carried out; the bottom-layer skills will be system log interpretation and data cleaning, the middle-layer skills will be cross-module process connection design, and the top-layer skills will be abnormal transaction pattern modelling and digital-intelligent rule inversion. Now, "multi-skilled" does not mean being knowledgeable in both accounting and taxation, but rather having the ability to connect accounting logic, link data and understand system rules.

Rearrangement of the competency gradient is also shown in the modifications to the capability transition path at the same position. In the past, the promotion path for the position of general ledger accountant after the value chain reconstruction may have been shortened or bypassed. The new transition path requires that finance and business staff be able to obtain system optimisation ideas from the process of a single transaction, feed this ability back to the rule configuration layer, and so on. Recently, the demand for multi-skilled staff has decreased, so project-based tasks have been added to the training modules, and each time the staff can successfully complete cross-system reconciliation or rule correction, their level of competency is increased by one grade. Therefore, the boundary of the position has been expanded, and the same position can now be used to create various combinations of multi-skilled competencies at different levels and form a dynamic adaptation system.

3. The Modular Path and Adaptation Model for Competency Reconstruction

3.1 Separation and Recombination of Capability Units Based on Task Granularity

The foundation of the division of capabilities is to divide the daily work at all levels of the finance and business departments into independent task units, and each unit has clear inputs, outputs and processing rules. With the closure of cross-border settlement by customs, currency revaluation and offshore transaction tagging have been introduced; these can be considered the smallest capability units, and the division basis is whether they can be managed by a digital-intelligent system or need human intervention. At the time of division, redundant capability units, such as the manual review of paper documents, are designated as replaceable, and at the same time, core capability units, such as pattern discrimination of abnormal transactions, are kept and recombined. This division is not to leave them out, but to label the units of ability so that they can be standardised and combined later. Control rules for granularity division also need to be set in the division process; otherwise, either the granularity will be too small and the number of combinations will be excessive, or it will be too large and the flexibility of recombination will be lost. Granularity control is the atomicity of task execution; that is to say, a capability unit cannot be further divided into independently callable subtasks^[4].

Based on the different situations of the business, all kinds of task granules are organised into modules and new competency modules are created. The three capability units in the competency module of offshore trade are "cross-border message parsing", "exchange rate deviation threshold setting" and "abnormal link tagging", and the old single module of "voucher entry", "account summary" and "report generation" has been replaced. According to the coupling strength and invocation frequency of the tasks, assembly rules are set, and frequently co-occurring capability units are grouped into the same module. The recombined competency modules are pluggable; when the business rules of the customs closure change, only need to replace, add or delete some capability units, and do not have to redesign the entire job competency framework. Module assembly can be employed to use the same capability unit in different places; for example, the "abnormal link tagging" unit can be applied to both the offshore trade scenario and the cross-border fund reconciliation case to create a

cross-module reuse mechanism for capability units and reduce reconstruction costs.

3.2 The Adaptive Calibration Mechanism of Dynamic Competency Thresholds

The competency threshold is the minimum level of ability a person in a finance and business position needs to demonstrate in a specific task. Given the customs closure environment, this threshold cannot be fixed; rather, with an increase in the volume of cross-border trade, so too will the scope of system automation and the frequency of data anomalies. Collect the system logs and the duration of manual operation for the system during task execution in the adaptive calibration mechanism, and at that time, determine how well the current ability level matches the difficulty of the task. If the match deviation is too large, then either the upper or lower bound will be moved. With the increase in the number of offshore transactions, so too have the reconciliation errors; therefore, the upward adjustment will be relatively large, and after some operations are transferred to automation following a system upgrade, a downward adjustment will occur. The above mode of operation will not have too many false alarms or detection failures. Based on other factors, such as the length of the transaction link and the proportion of missing data in a field, set the task complexity coefficient for the calibration mechanism, then adjust it to change the threshold; thus, changes in the threshold will be based on both historical performance and the inherent difficulty of the current task.

The first is that the general idea of the calibration method is a closed-loop structure. Record the quality of completion for each task, such as the discrepancy detection rate and the rule correction accuracy rate, as well as the time it took to complete the task, in the system after the task is finished, and use this information to adjust the next threshold. At the same time, there are all sorts of competency dimensions, and different thresholds can be set for each; for example, the threshold of the data tracking dimension and the threshold of the rule configuration dimension can be changed at different times. If the task failure rate of a particular dimension exceeds the upper tolerance limit of the threshold more than once, then that threshold for the dimension will be divided into finer sub-dimensions, and thus a threshold tree structure will be built. Change the required attributes to match what the job actually needs; otherwise, there will be some that are not required and some that are missing. A closed-loop Design is used to reduce the effect of short-term fluctuations on the threshold and thus reduce threshold drift. Set a sliding time window and an upper bound on the rate of change of the calibration mechanism to guarantee the stability and convergence of the calibration process.

3.3 Topological Optimisation of the Competency Map for Digital-Intelligent Finance and Business Positions

A competency map is a type of graph, and its nodes are competency areas and edges represent the cooperation among these areas. After the customs closure, industrial upgrading has reduced the efficiency of the original star topology because the general ledger accountant is the central node, and sub-nodes such as accounts receivable, accounts payable and taxation frequently need to communicate with offshore business. The Goal of Topology Optimisation is to change from a star topology to a combination of mesh and hierarchy. Direct Links are added between the nodes of the mesh part for cross-border settlement, foreign exchange exchange and system rule setup to reduce the forwarding delay at the central node. At the bottom of the hierarchy are the data operation nodes, such as log reading and field mapping; in the middle is the rule verification node, which is anomaly detection and link tracing; and at the top is the rule correction node, including threshold adjustment and module assembly. It is the combination of horizontal cooperation and vertical transmission; after the bottom-layer nodes have completed cleaning the data, they can directly notify the middle-layer verification nodes without being controlled by the top-layer scheduler.

It will be rearranged in the future. If the task load of a certain capability node, such as exchange rate revaluation, exceeds the threshold, it will be linked with an adjacent node, for example, offshore transaction identification, and a temporary collaboration cluster will be formed among them. Topology optimisation can also find and omit low-use edges at the same time; for instance, in the case of customs closure, the link between the traditional voucher review node and the offshore transaction node will be automatically weakened. Topology optimisation of the competency map is not a one-time construction but an iterative process; any change in the business rule will result in a local reconnection. The resulting topology can show the actual cooperation relationships among positions in digital-intelligent finance and business under the environment of customs closure, and it will provide an organized reference for talent selection and system design. Adaptive reconnection can be used to add an edge weight decay factor; that is, the weight of a long-unused edge decreases exponentially until it is severed,

and the weight of a frequently collaborating edge is increased and node fusion is triggered, so with the development of the business, the map structure will autonomously converge to an optimal state.

Conclusion

Build a theoretical system for reconstructing job competencies in the field of digital-intelligent finance and business at the three levels of the evolutionary mechanism, impact effect and reconstruction path, in light of the industrial upgrading of the customs union. Specify the deconstruction boundaries of traditional finance and the dimensions of business competency in this paper, and put forward that the criterion for distinguishing core retention from marginal stripping is the degree of task algorithmizability. From the above, it can be seen that the nature of the competency promoted by digital-intelligent embedding has changed qualitatively from "post-event verification" to "in-process monitoring" and "rule configuration", and there is also a nonlinear moderating effect of the customs closure environment on the ranking of factor weights. Based on the above studies, with the opening of cross-border data flows, the movement of finance and business functions has been put on the front line of the data link; the offshore trade model has created a capability conflict between accounting and risk control; and the reconstruction of the industrial value chain has changed the gradient transition path of multi-skilled competencies. Based on the analysis above, the three reconstruction directions put forward in this paper are: separation of task granularity and modular recombination; adaptive calibration of dynamic thresholds; and topological optimisation of the competency map. The three are the component layer, the calibration layer and the structure layer of competency reconstruction, and together they form an iterative adaptation model. In the future, all sorts of measures will be taken to strengthen the general capabilities of enterprises at all levels in the face of customs closures, multi-agent simulation will be employed to verify the effectiveness of the capability unit assembly rule, and the threshold calibration mechanism will be extended to cross-position collaboration scenarios to study the dynamic evolution laws and convergence conditions of the competency map.

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