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Aviation Port Logistics Oriented WEB Services Dynamic Optimization Combination Problem Research

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Abstract. Airport logistics is different from the way of logistics, its dynamic range is big, has the characteristics of loose coupling, according to the characteristics, respectively, with the parameters describing the interval, similarity, such as concept, according to the logistics of the WEB service processes, using genetic algorithm, optimize the combination of dynamic optimization problem, the simulation result shows that the proposed algorithm to a variety of robust optimization combination.

Keywords: Airport; Logistics index; WEB services; Genetic algorithm

1 Introduction

In the backdrop of the global industrial layout adjustment, airport construction is not only focus on the national economic and social development overall situation, leading the demonstration the strategic deployment of China's economic transformation, and the implementation of the central plains economic zone development, optimize the layout of regional economy of specific measures, but also realize leap-forward development, speed up the industrial upgrading of historic opportunity. Airport economy, a lack of relevant documents and materials are economic concept, mentioned the agenda, and even the entire central plains economic zone development have become hot topics in related field. According to the plan, the strategic orientation of airport is mainly for the international aviation logistics center, with aviation economy as the leading modern industrial base, the important portal of inland opening to the outside world, modern aviation city, the central plains economic zone core growth pole [1-4].

2 Related works

A good collaborative manufacturing system first need to set up a system architecture. It is a basis of the overall system builds and guide. Architecture has been clear about the system is composed of what parts, as well as the level of each part and their

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mutual relations. A reasonable architecture is very important to build effective system. According to the specification, the combination of manufacturing systems commonly used functions, in this paper, a Web service oriented service architecture of manufacturing systems, and points out that the underlying physical resources organization structure is the key to ensure the efficient management and utilization of the upper, manufacturing services for a later chapter related technology provides the framework of research [5-6].

Based on the architecture of collaborative manufacturing service introduces the manufacturing of the underlying network structure, provides the basis for resources organization. The architecture of collaborative manufacturing points 5 layers, the top is the application layer, to provide users with resource management and application interface, the lower layer is the core function, consists of a series of core function module manufacturing systems, including service manufacturing task management, resource management, security management, billing management, resources management include the management of information resource service content, namely to resources service registration, discovery, scheduling, and other functions. Based on the resource management, the system can build tasks for real-time dynamic optimal allocation and scheduling of resources, ensure the rapid and reliable task execution [7-9].

3 Genetic algorithm in the application of WEB services

Genetic algorithm is a kind of reference to the evolution rule of biological evolution of random search method. Starting from the generation of population genetic algorithm, the individuals in the population coding chromosome said. To set an appropriate degree of function, calculate the appropriateness of individual value, in accordance with the appropriate value of size, excellent selection method is used to choose individual genetic operation, such as crossover and mutation operation, and then get progeny population, repeat again, it make for evolution. Due to the genetic algorithm is a condition of function requirements, high parallelism, high search efficiency and better solving the global optimal performance such as the global probability search algorithm [10-13].The concrete solving process as shown in the figure below

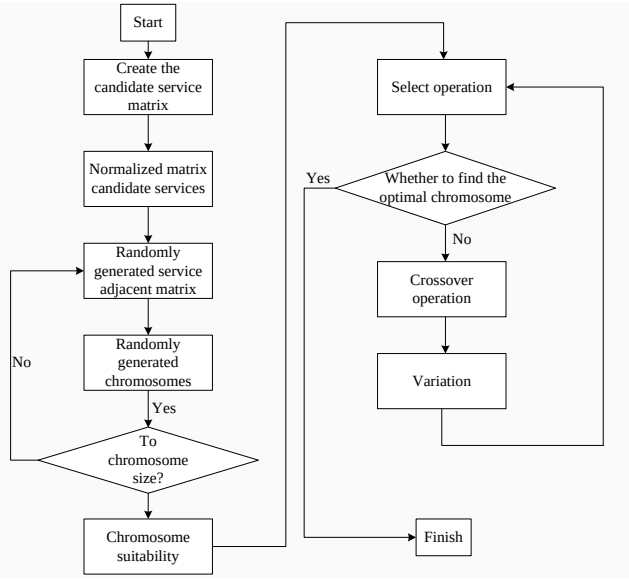

Fig. 1. A genetic algorithm for hybrid granularity resource optimization

4 The simulation experiment and result analysis

Figure 2 processes for scene:

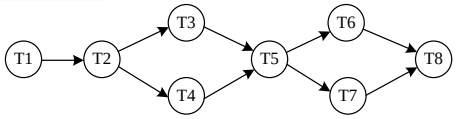

Fig. 2. One business flow sample

Task 3 and 4 to choose relationship, 7 6 and quest for parallel relationship. Chromosome string expressed as T1T2T3T4T5T6T7T8, length is 8.Each activity to have 10 candidate service node, each service has four attributes. The T5 for process composite resources.

For the above eight task node of a business process instance, task T_i candidate services said $S_i = \{S_i^1, S_i^2, ..., S_i^{10}\}$, i = 1,...,8.The setting of the ith a task can be the first j a service instance for S_i^j, S_i^j of them have four attributes {c, t, r, b}.

Each of the tasks in the business process instance node number in sequence. Because each of the given service portfolio includes service nodes have the same number, using decimal integer coding. Gene location of the value of the corresponding service number, if the corresponding task node is not in combination, was 0.Each gene in [0, 10] of a random integer, representing the task takes resources

number. Such as chromosomes X (4,1,2,3,7,6,3,8), in turn, said T1 to T8 resources used in the eight tasks are respectively S_1^4、S_2^1、S_3^2、S_4^3、S_5^7、S_6^6、S_7^3、S_8^8

First generate candidate service initialization data, including each candidate service QoS values, as a chromosome generated choreography of genetic data. Here, the Cost value range of (14.0, 25.0), the Time scope for (1.0, 1.0), the scope of Reliability for (0.3, 1), the scope of the Availability for (0.3, 1), a total of 60 data generated [14-15]. Data set: the crossover probability of 0.6, the mutation probability is 0.07, the QoS factor weights were 0.3, 0.5, 0.2 and 0.3, time constraints, 55, 125 cost constraints, reliability, availability, no constraint. Experiment plan: basic service data unchanged, only change the number of iterations, each number of iterations run 10 times, take the results of the average.

Table 1. Experimental statistics data

iterative times	chromosome	fitness	total price	total time
50	0705020009030607	10.20	91.23	29.77
100	0410040010040701	9.80	94.80	23.15
150	0710000509010303	10.79	88.89	26.29
200	0710000201030303	10.90	90.14	23.85
250	0705000209040703	11.15	83.92	22.52
300	0710000208030303	10.82	90.51	24.12
350	0701000201040703	10.96	87.87	20.14
400	0701000309030303	10.75	86.70	28.61
450	0705000209040303	11.01	83.22	26.08
500	0705000201010303	10.90	90.32	23.98
550	0705080009010303	10.66	87.44	28.83
600	0705020009030303	10.83	86.74	27.86
650	0710000201030303	10.90	90.14	23.85
700	0710010010040303	10.76	85.76	25.68
…	…	…	…	…
1000	0705000310040303	10.73	83.81	27.92
…	…	…	…	…
1500	0705040001040303	10.50	85.78	25.90
…	…	…	…	…
2000	0705000208030303	10.86	85.97	24.25

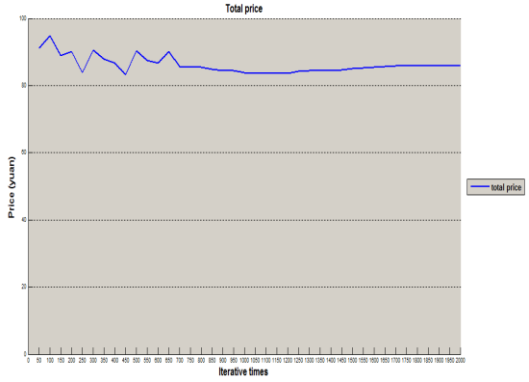

Fig. 3. The total price of different iterations

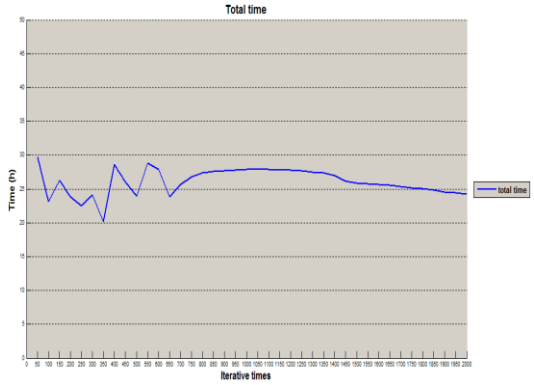

Fig. 4. The total time of different iterations

Based on the data shown in table 1 as shown in figure 3, and 4 respectively the total price and the total time of contrast figure. Graphic shows that with the increase of the number of iterations, total prices leveled off near 900 generations, gradually and the total time gradually leveled off near 1400 generations. Because of the multi-objective optimization, multiple target need to strike a balance to obtain the optimal, as a result, both close to the stationary point is different. In addition, as a result of chosen data is relatively simple, if reasonable quantity increase data selection, graphic effect will be more obvious.

5 Conclusion

This paper based on the concept of the business process service portfolio, defines the granularity service composition mixture, and the mixed size optimization to solve the mathematical model is given. Details the hybrid granularity service composition method of genetic algorithm design for service factors caused by the corresponding

treatment methods of genetic operators. Finally gives a genetic optimization solving instance, verify the effectiveness of the genetic multiple granularity service composition.

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