

# On Dialogue Management through Flow Discovery in Client-Facing Systems

Figure 1 depicts the flow discovered from SynthStudyAI-23, and the corresponding clustering metrics are in Table 1, showing that, similar to the insights obtained for StudyAI-23, the system generates longer responses than the users, especially in cluster  $c_{s5}$  (Delivery Time) and  $c_{s4}$  (Product Availability).

Figure 2 shows the flow discovered in SynthStudyAI-24, and Table 2 presents the clustering metrics, showing that, as with SynthStudyAI-23, the system provides longer responses than the users.

	Cluster	$ U / C $	$ W / U $	$\text{Sent}_c$
User	$c_{u0}$ : Customer Service	1428	$4.18 \pm 3.7$	$0.51 \pm 0.3$
	$c_{u1}$ : Delivery Delay	773	$9.48 \pm 6.6$	$0.38 \pm 0.2$
	$c_{u2}$ : Change Order	462	$12.50 \pm 8.4$	$0.30 \pm 0.3$
	$c_{u3}$ : School Issues	1196	$9.39 \pm 9.4$	$0.29 \pm 0.3$
	$c_{u4}$ : Payment and Refund	1159	$10.96 \pm 6.3$	$0.42 \pm 0.3$
	$c_{u5}$ : Online Purchases	736	$10.57 \pm 8.5$	$0.35 \pm 0.3$
System	$c_{s6}$ : Customer Support	540	$7.86 \pm 5.5$	$0.37 \pm 0.3$
	$c_{s0}$ : Delivery Information	291	$26.57 \pm 7.9$	$0.21 \pm 0.3$
	$c_{s1}$ : Help Available	2982	$5.33 \pm 1.4$	$0.51 \pm 0.1$
	$c_{s2}$ : Order Information	1663	$20.29 \pm 6.4$	$0.47 \pm 0.1$
	$c_{s3}$ : Thanks and Help	574	$36.02 \pm 23.9$	$0.49 \pm 0.2$
	$c_{s4}$ : Product Availability	390	$48.14 \pm 26.3$	$0.50 \pm 0.2$
	$c_{s5}$ : Delivery Time	1033	$60.22 \pm 23.4$	$0.53 \pm 0.2$
	$c_{s6}$ : Have a Great Day	306	$6.78 \pm 3.3$	$0.58 \pm 0.3$
	$c_{s7}$ : Contact via Webform	579	$33.70 \pm 29.7$	$0.52 \pm 0.2$
	$c_{s8}$ : Access Account	799	$33.01 \pm 19.7$	$0.50 \pm 0.1$
	$c_{s9}$ : Insufficient Information	323	$12.59 \pm 1.5$	$0.06 \pm 0.2$

Table 1: Clustering metrics for SynthStudyAI-23, customer (User) and system.

	Cluster	$ U / C $	$ W / U $	$\text{Sent}_c$
User	$c_{u0}$ : Issues and Questions	7725	$12.43 \pm 14.7$	$0.27 \pm 0.3$
	$c_{u1}$ : Understanding Confirmed	8391	$2.03 \pm 0.2$	$0.97 \pm 0.1$
	$c_{u2}$ : Order Communication	7023	$3.22 \pm 1.9$	$0.48 \pm 0.1$
	$c_{u3}$ : Order Status	5860	$2.99 \pm 0.8$	$0.49 \pm 0.8$
	$c_{u4}$ : Repeat Other Topics	4504	$2.06 \pm 0.5$	$0.50 \pm 0.0$
	$c_{u5}$ : Friendly Chat	5066	$1.39 \pm 0.8$	$0.81 \pm 0.6$
	$c_{u6}$ : Delivery Estimate	4555	$10.40 \pm 7.8$	$0.42 \pm 0.2$
	$c_{u7}$ : Phone Contacts	3814	$3.13 \pm 1.4$	$0.50 \pm 0.0$
	$c_{u8}$ : Complaints	1459	$8.97 \pm 3.10$	$0.11 \pm 0.2$
System	$c_{s0}$ : Customer Service	8922	$33.58 \pm 7.9$	$0.54 \pm 0.1$
	$c_{s1}$ : Offering Help	10925	$7.20 \pm 1.9$	$0.99 \pm 0.1$
	$c_{s2}$ : Order Information	10481	$47.77 \pm 35.8$	$0.47 \pm 0.2$
	$c_{s3}$ : Information Request	9788	$13.10 \pm 4.3$	$0.49 \pm 0.0$
	$c_{s4}$ : Help Request	5668	$12.11 \pm 4.9$	$0.67 \pm 0.3$
	$c_{s5}$ : Privacy Statement	11195	$56.67 \pm 15.2$	$0.50 \pm 0.0$

Table 2: Clustering metrics for SynthStudyAI-24, customer (User) and system.

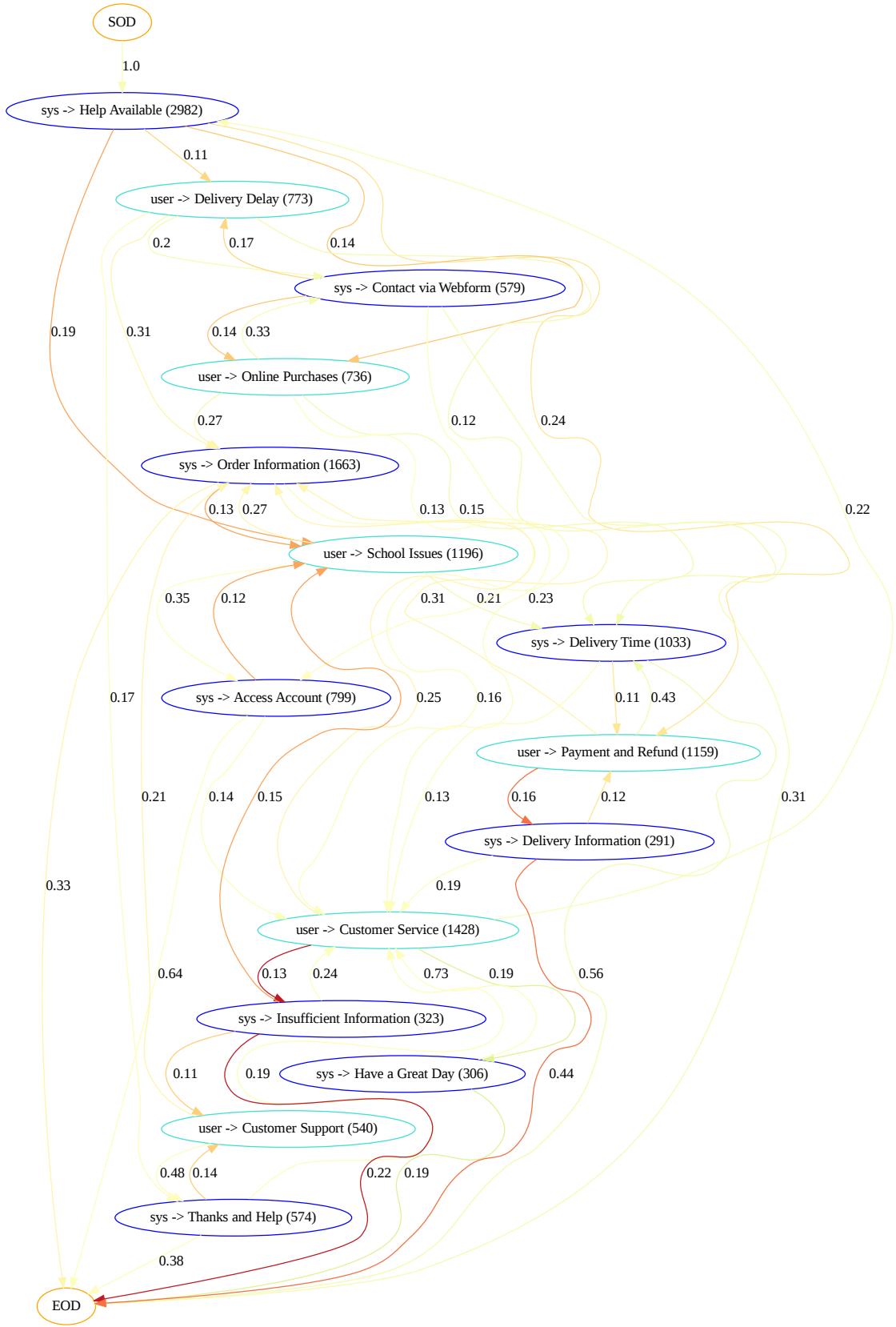


Figure 1: Dialogue flow discovered for SynthStudyAI-23.

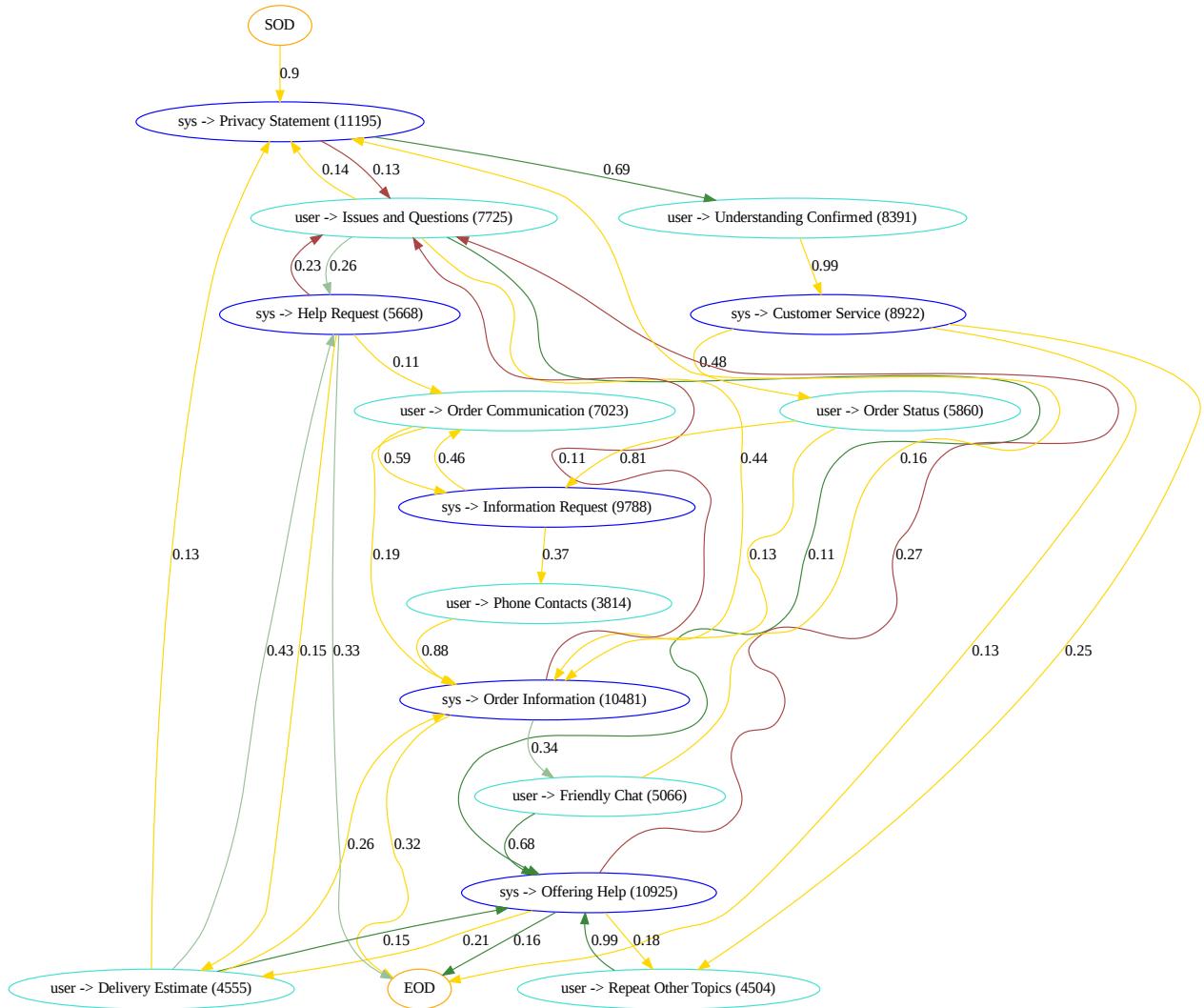


Figure 2: Dialogue flow discovered for SynthStudyAI-24.