

Player Guild Dynamics and Evolution in Massively Multiplayer Online Games

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ABSTRACT

In the latest versions of massively multiplayer online games (MMOGs), developers have purposefully made guilds part of game environments. Guilds represent a powerful method for giving players a sense of online community, but there is little quantitative data on guild dynamics. To address this topic, we took advantage of a feature found in one of today's most popular MMOGs (World of Warcraft) to collect in-game data: user interfaces that players can modify and refine. In addition to collecting data on in-game player activities, we used this feature to observe and investigate how players join and leave guilds. Data were analyzed for the purpose of identifying factors that propel game-world guild dynamics and evolution. After collecting data for 641,805 avatars on 62 Taiwanese World of Warcraft game servers between February 10 and April 10, 2006, we created five guild type categories (small, large, elite, newbie, and unstable) that have different meanings in terms of in-game group dynamics. By viewing players as the most important resource affecting guild life cycles, it is possible to analyze game worlds as ecosystems consisting of evolving guilds and to study how guild life cycles reflect game world characteristics.

INTRODUCTION

THE DRAMATIC INCREASE in the number and quality of massively multiplayer online games (MMOGs) since 1997 has impacted not only the game market but also multiple aspects of gaming society and culture.^{1,2} The popularity of gaming and the formation of MMOG communities have resulted in a breakdown of boundaries formed by age, sex, race, and national origin. MMOGs and online/offline social interactions are drawing considerable attention from researchers in the computer and social sciences.³ Topics attracting the greatest research interest include how players participate in processes that form social norms in virtual societies and how players gain experience and expand their social networks inside and outside the games they play.⁴ In

this study, formal player organizations called *guilds* serve as the basis for addressing these questions. Online game guilds have a hierarchical leadership structure that allows players to act as unified groups to solve joint missions. Whereas guilds used to be viewed as informal and unplanned organizations, some recently released online games have incorporated guild formation into their structure, adding mechanisms for establishing guilds and designing goals and missions that require coordinated actions by members of well-organized teams.^{5,6,7} Since online players frequently change their personal gaming goals, they often leave active guilds to join others. Accordingly, online guilds are now experiencing cyclical lives that entail creation, development, member suspension, splitting, merging, and disbanding, thereby becoming perhaps the most

representative social organization in online game societies.

Conducting online gaming research poses several challenges. Most efforts to date have entailed qualitative approaches (e.g., surveys, individual and group interviews) for investigating motivations for joining guilds. However, researchers have learned that the dynamic in-game behaviors of players who immerse themselves in game culture are difficult to observe and record,^{8,9} resulting in deficiencies in understanding individual player behaviors of interactions among guild members. Accordingly, we designed a quantitative approach to studying this topic that takes advantage of a new feature found in recently released games. Blizzard Entertainment has created a system that allows players of its World of Warcraft (WoW) game to create and modify their own user interfaces while playing online. We programmed a user interface to record hourly data for approximately 600,000 avatars belonging to 200,000 players on 62 WoW servers in Taiwan. The collected data were analyzed in terms of guild-joining behavior, scale of increased guild participation, and movement between guilds.

Guild participation: player motivation

Ever since the creation of multi-user domain games (MUDs, precursors of MMOGs), guilds have attracted considerable attention from players, game developers, and researchers and evolved to become an important factor in game design following the successful implementation of guild mechanisms in EverQuest and Lineage. These mechanisms (which continue to be refined and improved) are now viewed as important selling points for games. The high percentage of players joining guilds also attests to their essential position in game worlds and their suitability as a focus for research on MMOG development, the behaviors of players who join guilds, and social tendencies in game playing. For long-term users and power gamers, the importance of guilds can approach that of the game itself.^{4,10}

Initially, decisions to join guilds and the process of doing so were considered the most important criteria for player categorization. As guilds evolved, researchers broadened their investigations to include player experiences, the sharing of those experiences, searches for friendship, cooperation for performing missions, and forming virtual social norms.^{4,11} Guild structure and activity are now viewed as representative of player interactions and social networks. Guild growth and decline are viewed as reflections of player needs, especially

since guilds now tend to satisfy the social needs of players in virtual worlds.

Guild dynamics

MMOG guilds undergo dynamic changes due to interactions between game worlds and player motives. At least three factors specifically inform the dynamic processes of guild development:

1. *Game world design.* Design features and underlying mechanisms drive player interactions and guild creation. Examples include avatar/experience upgrading and limitations on average level and number of avatars allowed to participate in group missions.
2. *Changes in guild member motives.* Studies of immersion experiences and learning processes based on Murray's¹² proposals have shown that players' purposes, motives, and behaviors change continually, thus influencing their guild participation and changes in guild characteristics.¹³
3. *Guild management.* Modifications in guild settings and rules (e.g., the Dragon Kill Points reward system and member responsibilities) affect relations among members and relations between guilds and their individual members. In return, player interactions and influxes of new members effect change in guild formation, goals, and rules.

Almost all of the most recently released MMOGs provide collaborative missions (called *raiding missions* or *raids*) that require guilds to organize themselves and use large quantities of resources. In the interest of enhancing the collaborative problem-solving capabilities of the guilds they belong to, power gamers may use their superior skills and authority to modify rules,¹⁴ increase the power of guild management, make direct requests for resources from other members, and so on. Some members (especially nonpower gamers) may react by leaving guilds. At the other end of the spectrum, some players leave guilds that are static for guilds that are more dynamic and more capable of executing difficult missions—all in pursuit of personal gaming goals. Some guilds recruit members according to guild needs. For instance, an *Uber guild* may decide to only accept new members who have useful skills and/or the best equipment, or they may exclude or otherwise force out members who do not satisfy playing time or playing style requirements. Thus, the disbanding and splitting of old guilds and establishment of new ones is now considered a com-

mon MMOG phenomenon. This supports our decision to focus on guild dynamics to study game world rules and changes in player purpose and expectations. By viewing players as the most important resource affecting guild life cycle, it is possible to analyze game worlds as ecosystems consisting of evolving guilds.

MATERIALS AND METHODS

Between its release in November 2004 and the most recent data available (June 2006), WoW attracted more than 6.5 million subscribers, almost doubling the previous record of 3.5 million established by *Lineage*. It is currently believed that one-half of the world’s MMOG subscribers are primarily playing WoW.¹⁵ In Taiwan, over 200,000 players subscribed to WoW between its release date and October 2005, making it the most popular game in that country. Many players and analysts acknowledge that WoW has generated completely new styles of play and game culture.

As mentioned earlier, Blizzard Entertainment has made one of the most dramatic moves in this regard by giving WoW players the ability to create and modify their personal interfaces by means of an application programming interface (API). Following Ducheneaut’s research methodology,^{10,16} we used this WoW feature to collect progressive data on grouping, communication, and guild formation and development. We also used this tool to monitor changes in avatar participation in specific guilds over time and to utilize guilds as game agents for

the purpose of analyzing their distribution, differences, and life cycles.

For this study, we designed a plug-in attached to 124 avatars for collecting data from 62 Taiwanese WoW game servers (21 player-versus-environment [PvE] and 41 player-versus-player [PvP]) between February 10 and April 10, 2006. We chose this time period due to increased stability among Taiwan’s 60 WoW game servers after 4 months of development and operation, plus the addition of two new servers (thus allowing for comparisons of player behaviors between mature and new servers). Another reason is the lack of major modifications and updates in game design and management that tend to influence player behavior.

Data on avatar nickname, race, class, level, and location were automatically recorded three times each day (Table 1). Whereas in older games such information could only be obtained via direct avatar interaction, our plug-in made it possible to perform a diachronic census. We used these WoW design features to assist us in analyzing descriptive statistics on background and settings prior to analyzing guild life cycles. First, our modified user interface was used to collect data from 60 servers between February and April of 2006. Increases were observed for such measures as total number of avatars, average level, number of avatars achieving the highest level, and average number of guild members. However, we also noted an overall decrease in the total number of guilds over time—a reflection of the tendency of guilds to merge as game worlds develop. We also found that almost one-half (48%) of all horde avatars were placed on PvP servers, compared to 28% placed on PvE servers (Table 2).

TABLE 1. EXAMPLE OF WoW AVATAR BEHAVIOR DATA COLLECTED VIA THE GAME’S PLAYER DESIGN USER INTERFACE

<i>Data</i>	<i>Avatar ID</i>	<i>Server ID</i>	<i>Level</i>	<i>Race</i>	<i>Class</i>	<i>Guild ID</i>
02/10/2006	A1	S1	55	Orc	Warlock	G1
02/10/2006	A2	S2	57	Dwarf	Hunter	G2
...
02/11/2006	A1	S1	56	Orc	Warlock	none
02/11/2006	A4	S6	60	Human	Mage	G25
...
02/12/2006	A1	S1	57	Orc	Warlock	G3
02/12/2006	A3	S5	22	Night Elf	Warrior	G24
02/12/2006	A4	S6	60	Human	Mage	G15
...

Note: The A1 avatar level was upgraded from 55 on February 10, 2006, to 57 on February 12, 2006. By comparing guild status between February 10 and 11, one can note avatar movement away from the G1 guild.

TABLE 2. DATA COLLECTED FROM TAIWANESE WoW SERVERS BETWEEN FEBRUARY AND APRIL 2006

	<i>Player vs. environment server</i>			<i>Player vs. player server</i>		
	<i>Avatar number</i>	<i>Average level</i>	<i>Lv60 member (%)</i>	<i>Avatar number</i>	<i>Average level</i>	<i>Lv60 member (%)</i>
<i>February 2006</i>	9796.37	31.27	18%	11534.74	32.95	25%
	<i>Guild number</i>	<i>Average guild size</i>	<i>Alliance/horde</i>	<i>Guild number</i>	<i>Average guild size</i>	<i>Alliance/horde</i>
	202.05	48.89	72:28	196.89	58.96	71:29
<i>April 2006</i>	<i>Avatar number</i>	<i>Average level</i>	<i>Lv60 member (%)</i>	<i>Avatar number</i>	<i>Average level</i>	<i>Lv60 member (%)</i>
	8684.15	32.16	21%	10145.88	34.19	28%
	<i>Guild number</i>	<i>Average guild size</i>	<i>Alliance/horde</i>	<i>Guild number</i>	<i>Average guild size</i>	<i>Alliance/horde</i>
	174.51	50.53	52:48	169.78	60.72	52:48

Note: Data includes total number of avatars, average avatar level, percentage of level-60 avatars among all avatars on the servers, total number of guilds, average guild size, and Alliance/Horde ratio for PvP and PvE servers. Data collected four times per day for an average of 40 PvE servers and 20 PvP servers.

RESULTS AND DISCUSSION

Guild participants

Avatar level distribution serves as an indicator of current game world development. In addition to the 60 Taiwan WoW servers described above, two were added during the study period, both aimed at new gamers. As shown in Figure 1, of the 10,696 avatars whose average level was 30, 2,655 (26%) had achieved the highest possible level. None of the other levels from 0 to 59 accounted for more than 4% of all avatars. Based on the lower threshold for players entering WoW compared to previously released MMOGs (and knowing the highest possible level), we believe the large percentage of high-end players is a special WoW phenomenon.

According to our collected data on player choices for faction, race, and class, no special tendencies or patterns were noted in terms of guild membership with one exception: the percentage of avatars joining guilds increased steadily with avatar level (Table 3). Between levels 16 and 20, approximately one-half of all avatars belonged to at least one guild. At level 60, 93% of all avatars were guild members. Combined, the average percentage of guild membership for all WoW avatars in the study sample was 65.7%. The data strongly support the idea that in WoW,

guild membership is a common phenomenon and that guild play holds an important position.

Guild-focused missions and guild dynamics

Methods for executing missions can be used to categorize guild type, since intra-guild communication and mission and member management are considered important factors in an individual's decision to join or leave a guild. Researchers of games such as EverQuest have described guild mission play as "work-like play."^{2,17} Regardless of whether mission execution is considered work or play, it has become a very popular aspect of WoW's high-end content. Over one-third (35%) of the Taiwanese WoW guilds we collected data on were raid guilds. We therefore placed special analytical emphasis on how these high-end activities influence player society.

Since membership numbers and average guild member level are representative of a guild's human resources, the two criteria directly influence the capability of a guild to execute raids. From our analysis, we determined that (a) game world guilds can be categorized into several distinct types—small, large, elite, unstable, and newbie; and (b) guild size distributions are similar across different servers—an average of 180 members, with a small number of

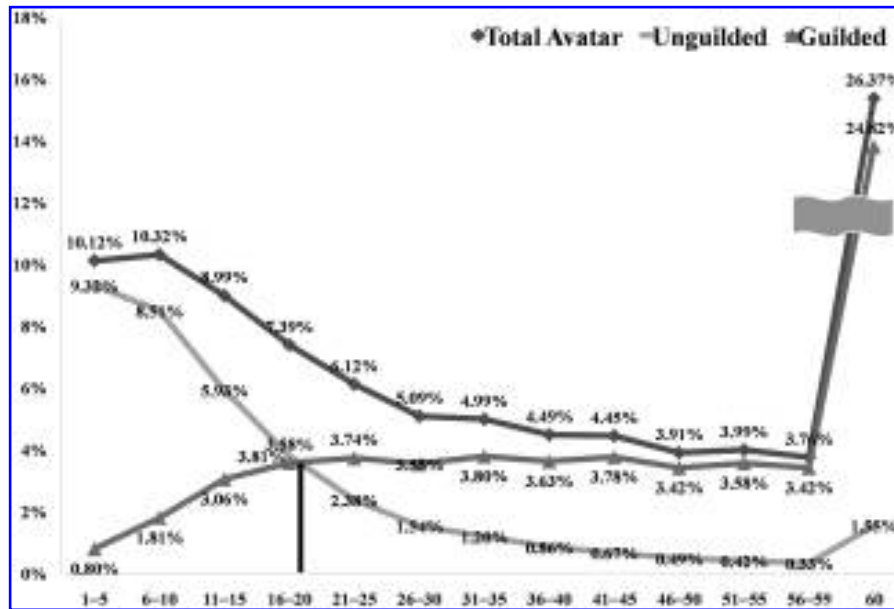


FIG. 1. Avatar level distribution for World of Warcraft in Taiwan. Data on 10,696 avatars was collected from 2 newly added servers on February 10, 2006. More than half of all avatars between levels 16 and 20 joined guilds.

extra-large guilds and a large number of small ones. Furthermore, since WoW designers took into consideration different goals among early, middle, and late-stage players (e.g., chatting, exchanges of support and resources, executing guild missions), we

suggest that the distribution of guild member level reflects guild activities, goals, and functions.

We therefore gathered data on avatar guilds, classes, levels, and locations from 62 Taiwanese WoW servers in February 2006 and divided the

TABLE 3. PLAYER GUILD PARTICIPATION DIFFERENCES BETWEEN SERVERS AND FACTIONS

		<i>Player vs. environment server</i>			<i>Player vs. player server</i>			
<i>Alliance</i>	<i>Level</i>	<i>Percentage of avatar join guilds</i>	<i>Accumulated percentage of avatar join guilds</i>	<i>Accumulated play time (day)</i>	<i>Level</i>	<i>Percentage of avatar join guilds</i>	<i>Accumulated percentage of avatar join guilds</i>	<i>Accumulated play time (day)</i>
		15	42%	8%	0.66	15	41%	7%
	30	76%	19%	2.76	30	72%	19%	2.80
	45	88%	32%	6.97	45	85%	32%	7.00
	59	94%	46%	12.76	59	93%	45%	12.81
	60	94%	66%	13.36	60	93%	63%	13.54
<i>Horde</i>	<i>Level</i>	<i>Percentage of avatar join guilds</i>	<i>Accumulated percentage of avatar join guilds</i>	<i>Accumulated play time (day)</i>	<i>Level</i>	<i>Percentage of avatar join guilds</i>	<i>Accumulated percentage of avatar join guilds</i>	<i>Accumulated play time (day)</i>
		15	38%	7%	0.59	15	38%	7%
	30	73%	18%	2.4	30	73%	19%	2.3
	45	84%	29%	6.24	45	85%	30%	6.34
	59	94%	42%	11.41	59	94%	42%	11.56
	60	94%	65%	11.94	60	94%	63%	12.21

Note: Data collected on February 10, 2006, for 641,805 avatars on 60 servers.

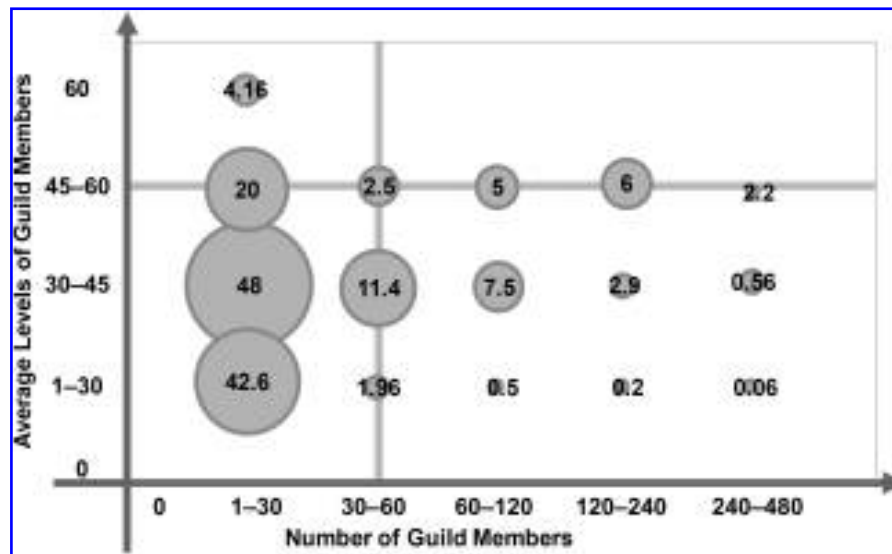


FIG. 2. Distribution of guild numbers in terms of guild size. X-axis: number of guild members; y-axis: average guild member level. No direct relationship was found between the number of guilds with an average member level of between 45 and 60 and guild size. Very few guilds with those average member levels had between 30 and 60 members. Data on 641,805 avatars were collected from 60 servers on February 10, 2006.

11,207 identified guilds into scale categories according to member number and average level. According to the results shown in Figure 2, the average guild level was close to the average level of all avatars on the 62 servers, and the number of guilds with average levels between 1 and 45 decreased with increases in average guild size. While this data support our general assumptions, we noted an unusual distribution of guilds whose average member level ranged from 45 to 60: a large number with fewer than 30 members, a small number with 30 to 120 members, and a large number with 120 to 240

members. Reasons for this unusual distribution require further analysis.

Next, we recorded changes in guild size on the 62 Taiwan WoW servers from February to April of 2006 and compared differences between the two newest servers (in operation for 2 months) and the 60 that had been operating for at least 4 months. Since new avatars were continually being created on the newest servers, we observed that the guilds on those servers were more active than the guilds on the older ones (Fig. 3a). These results indicate a thriving initial stage in the Taiwanese WoW game

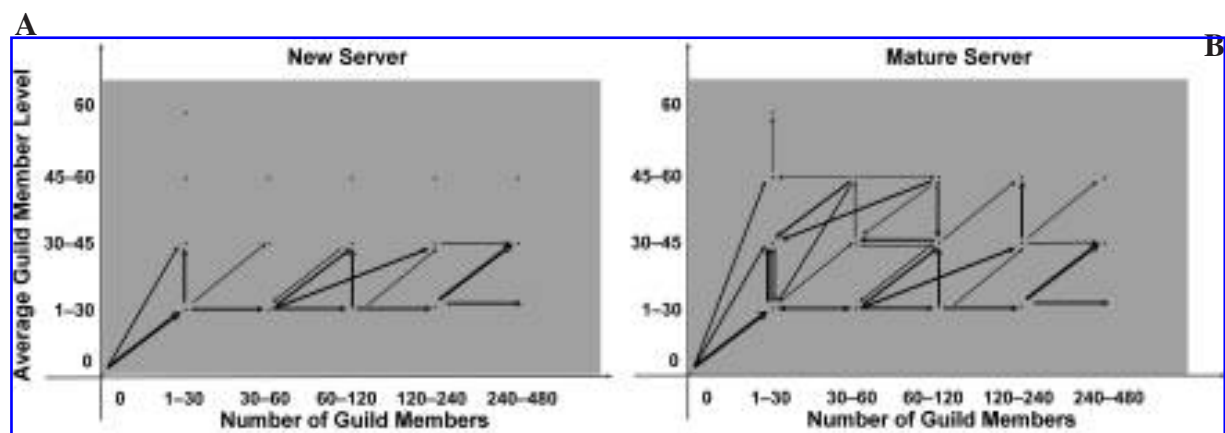


FIG. 3. Differences between new and mature servers. Arrow direction represents changes in membership number and average avatar level; thickness represents transformation probability potential. In 3A, all guilds along all scales gained strength. A mix of growth and decline is noted in 3B. Data were collected an average of four times per day between February and April 2006 from an average of 40 PvE servers and 20 PvP servers.

world and a lack of interest among guilds on older servers to recruit new avatars (Fig. 3b). Instead, the focus of these guilds is on membership dynamics and competition with other guilds.

In addition to differences in static guild scale, we investigated the dynamics of guilds that can be affected by gaming environment (Fig. 4). According to the upper boundary of avatar level (60), a relationship was noted between increasing average level of avatars on a server and growth in the average level of guilds as their members approached level 60. The opposing forces of guild expansion and centralization resulted in an ambiguous boundary of guild size (maximum of 480 members). We noted that the greatest guild instability occurred among those with approximately 60 members whose average level was also 60.

According to the observed changes in guild scale, (a) newbie guilds with an average avatar level below 45 and average number of members above 30 regularly attracted additional newbie members, meaning that the average level and number of members increased very fast; (b) smaller guilds with an average avatar level fewer than 45 and fewer than 30 members tended to remain stable due to the simultaneous decline of established guilds and appearance of new guilds; (c) large guilds whose average avatar level was above 45 and whose number of members exceeded 120 were very stable; (d) elite guilds whose average avatar level was the maximum 60 but with fewer than 30 members tended to

decline; and (e) guilds whose average avatar level exceeded 45 and with between 30 and 120 members were very unstable and tended to decline (Fig. 4).

A prototype WoW guild life cycle can be constructed from these results (Fig. 5). Most guilds start very small and are primarily comprised of low-level members, and large numbers of these small guilds are continuously being established on individual servers. Most come up against standard guild management problems right away, and only a few successfully solve them and develop into functional newbie guilds capable of recruitment and level upgrading. Many become unstable guilds with small numbers of members who have achieved high avatar levels; lower-level avatars in these guilds tend to leave and join others. This is especially true for long-term newbie guilds that maintain small membership numbers. Large guilds that successfully maintain their community relations can use their collective resources to execute multiple raids. Those that don't must struggle to overcome their lack of stability in order to become large guilds capable of executing the most complex missions. A significant number suffer from the loss of key high-level members, while others lose large numbers of low-level members and consequently evolve into elite guilds that tend to disband once their members acknowledge their inability to garner enough resources to conduct raids. These guild dynamics appear to be influenced by game world design, changes in member motives, and guild management issues (Fig. 5).

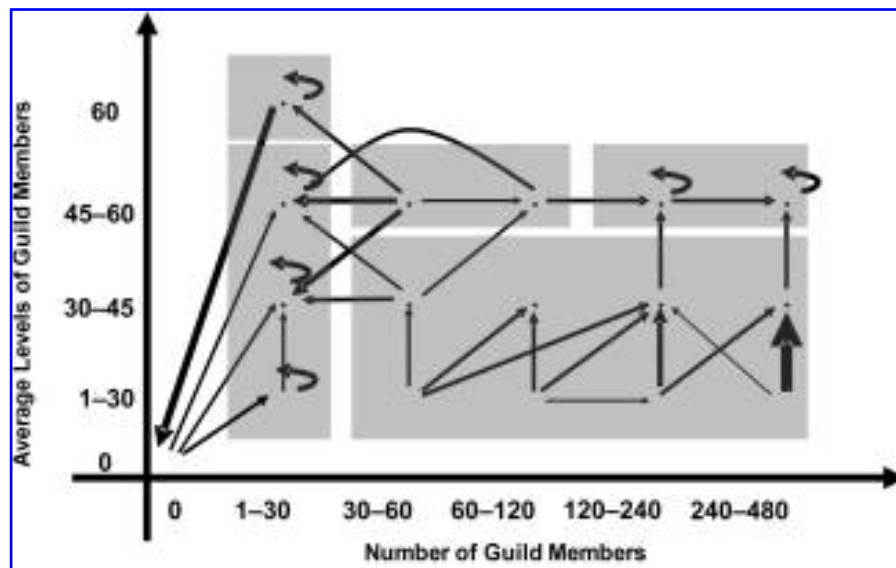


FIG. 4. Guild scale transformation. Arrow direction represents changes in membership number and average avatar level; thickness represents transformation probability potential. Gray color represents guild category in terms of membership number and average level. Data collected an average of four times per day between February and April 2006 from an average of 40 PvE servers and 20 PvP servers.

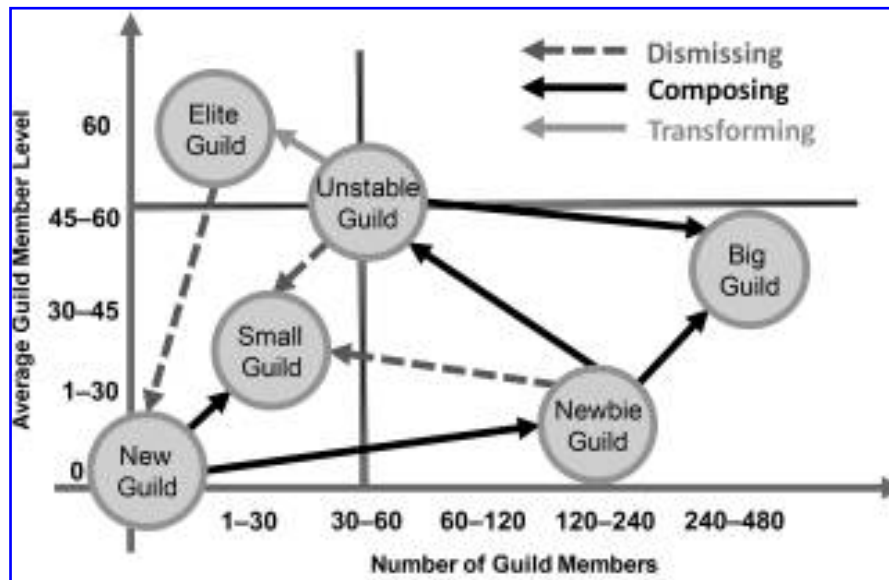


FIG. 5. Life cycles for five basic guild types. Vertical line (representing a limit of 40 avatars per raid mission) provides evidence that game design influences guild dynamics. Horizontal line represents a development threshold for average guild member level, which emerges naturally from player interactions.

In summary, mature guilds must actively develop their memberships in terms of number and average level to ensure their survival, which explains why new players find it very easy to join WoW guilds. These conditions and management needs distinguish WoW and other recently released games from older MMOGs that focus on small guild play. The WoW emphasis on solving missions means that its guilds are likely to differ significantly from traditional game guilds consisting of mixes of offline and online friendship networks. The WoW game design also guarantees instability and variety in guild and community network structure.

CONCLUSIONS

In this report, we verified three WoW-play phenomena in Taiwan: (a) choice of WoW avatar race is strongly associated with server type (PvP or PvE); (b) when new players enter the game for the first time, they tend to join guilds and participate in guild activities right away; and (c) as game worlds develop, guilds compete with each other and evolve into several categories of stable guilds. These phenomena reflect game design and individual player motivations.

Regarding guild dynamics, we noted the influences of game environment on guild life cycle (i.e., formation, development, membership loss, and breakup). Based on the number and average level

of late-stage guild members, we found that game guilds express distinct behaviors and that the WoW raid feature exerts a strong influence on guild ecology. Furthermore, we observed that poor guild member management over multiple raid missions often leads to decline and instability. This may explain why WoW designers made an important game modification in August of 2006: in addition to raid missions requiring 20 to 40 avatars, the game now includes small-scale raid missions requiring only 15 to 25. We believe this change will sharply reduce the gap between early and late-stage play.

New data sources and collection options are creating many research opportunities. In this study, we confirmed that the client-designed user interface feature of WoW can be used to monitor short-term avatar action. In terms of game development and design, the quantitative methods introduced in this paper can help companies study game situations in order to understand how various mechanisms influence player behaviors. The same methods can support research efforts to better understand guild dynamics, game design, game society development, virtual world characteristics, and player organization.

Future researchers may want to explore several topics using the methods described in this paper—for example, correlations between player characteristics and avatar character decisions. This knowledge can be used to determine if game world differences tend to influence player choices or if

player choices lead to game world partitions. Other research possibilities are studying the influences of Western and Eastern cultural differences on game worlds and searching for virtual world influences on physical world behaviors.

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