3676 Digital Hearts Holdings

Sponsored Research
3 July 2020

Sessa Investment Research

BASIC

Key Indicators	
Share price (7/2)	867
YH (20/2/10)	1,118
YL (20/3/23)	552
10YH (16/9/29)	2,200
10YL (20/3/23)	552
Shrs out. (mn, shrs)	23.891
Mkt cap (¥bn)	21.072
EV (¥bn)	19.914
Current ratio	145%
ADVT (22days avg, ¥ mn)	101
Shr eqty ratio (3/31)	46.4%
FY3/20 P/E (act)	24.0x
FY3/20 P/B (act)	3.85x
FY3/20 ROE (act)	16.3%
FY3/21 DY (CE)	1.59%

Share Price Chart 52 weeks

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Increasing opportunities in the software testing market
Further accelerating operations to achieve high growth

Executive Summary

The following three points about DIGITAL HEARTS HOLDINGS (DHH) are of interest.

1. In recent years, DHH has been investing management resources in the Enterprise Business, while firmly anchoring itself in the Entertainment Business, which is expected to generate stable cash flows. The company is making progress in transforming its revenue structure, and the investment in the Enterprise Business is entering the recoupment phase.
2. COVID-19's spread will likely accelerate the proliferation of digital transformation (DX)*(pg.2) even further, serving as a tailwind for DHH's shift to the Enterprise Business.
3. The company's share price has underperformed the market average and competitors, owing to an ongoing decline in profits due to investments associated with transforming the business structure. The P/B and P/E ratios have recently been at the lowest level in several years. However, if the recent turn to profitability on a quarterly basis in the Enterprise Business stabilizes and shores up earnings, the share price may be reevaluated.

DHH is a pioneer among software testing specialist firms in Japan. Based on the entertainment field, where it has a track record in debugging**, DHH is rapidly muscling into system testing** in the enterprise field, as it aims to be "Asia's No. 1 comprehensive test solutions provider."

In the Entertainment Business, its founding business, DHH virtually splits the domestic debugging market with a leading competitor. The company expects stable growth and ongoing revenues in debugging, buttressed by a high barrier to entry. In the game console market, sales will likely remain robust, supported by the testing of newly-developed games related to the latest models of consoles (PlayStation 5, Xbox Series X) slated for release targeting year-end sales. The expansion of mobile games fueled by the spread of 5G may serve as a tailwind.

In the Enterprise Business, the COVID-19 outbreak has accelerated progress in DX, driven by corporate response to remote work. System testing will likely be a significant driver of DHH's future growth, as the outsourcing ratio of system testing is expected to continue rising.

DHH transitioned to a new management structure in June 2017. Ever since, it has actively invested in the Enterprise Business, referring to the current stage of the business as the "Second Founding" period. Although the company has continued to incur upfront costs to create a business infrastructure and hire human resources, the segment's sales have expanded at a rate above 50% annually for the last three years. Since 2Q FY3/20, the segment turned profitable on a quarterly basis, showing that efforts are starting to bear fruit.

As a medium- to long-term roadmap, the company set the following targets for the Second Founding period: ¥50.0bn in sales and ¥10.0bn in EBITDA. Out of the ¥50.0bn in sales, the company aims for ¥20.0bn to come from the Enterprise Business, meaning that the key to achieving the target will be growth in the Enterprise Business. The shift in focus to the Enterprise Business since transitioning to a new management structure is starting to bear fruit, and based on this track record, achieving ¥20.0bn in sales will likely come within reach.

Earnings have been weighed down by heavy investments accompanying the shift in business structure to the Enterprise Business. As a result, DHH's share price has underperformed the market and competitors in the last few years. Meanwhile, ROE has remained relatively high, and the P/B and P/E ratios are at the lowest levels in the past few years. The share price may be reevaluated, if the Enterprise Business starts showing clear signs of turning profitable.

In FY3/20, DHH achieved record sales of ¥21,138mn (+9.8% YoY). Sales came to ¥16,115mn (+1.0% YoY) in the Entertainment Business and grew sharply to ¥5,022mn (+52.1% YoY) in the Enterprise Business. Operating profit was ¥1,394mn (-13.2% YoY), with the YoY decrease mainly coming from a rise in M&A-related expenses. DHH booked an extraordinary loss of ¥75mn, as it implemented structural reforms in advance, in response to changes in the business environment stemming from COVID-19. As a result, profit attributable to parent company shareholders amounted to ¥792mn (-49.7% YoY). That said, the YoY decline reflects in large part the ¥733mn in extraordinary income booked in FY3/19. Factoring out the extraordinary income and losses, the bottom line in FY3/20 was on par with FY3/19.

DHH left its earnings forecasts for FY3/21 undisclosed, citing the difficulty in developing estimates due to the impact of the COVID-19 outbreak.

Glossary of Key Terms
P1.

***Digital Transformation (DX):** Transforming the customer experience, digitally and physically (through new products, services, and business models) to create value and establish a competitive edge. DX is typically done by leveraging the "third platform" (i.e., crowd, mobility, big data/analytics, social technology), while responding to disruptive changes in the firm's external ecosystem (e.g., customers, markets) and driving transformation of the internal ecosystem (e.g., organization, culture, employees). (IDC Japan)

****Debugging, system testing:** Testing computer programs, etc. to identify, analyze, and report bugs. DHH calls the testing of equipment related to the Entertainment Business "debugging" and testing related to the Enterprise Business "system testing."

❶ Digital Hearts Holdings: Consolidated Earnings Trend

JPY mn, %	Net Sales	YoY %	Oper. Profit	YoY %	Ord. Profit	YoY %	Profit ATOP	YoY %	EPS (¥)	DPS (¥)
FY2016/3	**15,011**	*13.0*	**1,963**	*29.4*	**1,958**	*28.4*	**361**	*-33.0*	**15.72**	**8.50**
FY2017/3	**15,444**	*2.9*	**1,906**	*-2.9*	**1,997**	*2.0*	**795**	*120.2*	**35.58**	**9.50**
FY2018/3	**17,353**	*12.4*	**1,735**	*-9.0*	**1,782**	*-10.8*	**1,200**	*50.9*	**55.14**	**11.50**
FY2019/3	**19,254**	*11.0*	**1,605**	*-7.5*	**1,651**	*-7.4*	**1,575**	*31.3*	**72.13**	**13.00**
FY2020/3 CE	**21,138**	*9.8*	**1,394**	*-13.2*	**1,372**	*-16.9*	**792**	*-49.7*	**36.21**	**14.00**

❷ Key Questions

◉ Delivering results in the "Second Founding" period

—Eiichi Miyazawa, the company's founder, decided to shift the growth driver of the company from entertainment to enterprise, and entrusted Genichi Tamatsuka to steer the company during its "Second Founding" period. The Enterprise Business has since grown substantially in the last two-and-a-half years, but profits continued to decline due to upfront investments, and the share price underperformed the market average. When will investors be able to savor the fruit (i.e., bottom line) of the realization of goals in the "Second Founding" period?

◉ Maintaining or raising profitability in the cash-cow entertainment field

—DHH has established a solid market share in the entertainment field, and stable market growth can be expected. The company's investments in the Enterprise Business are possible precisely because cash flows in the Entertainment Business are steady. However, results in this field are susceptible to the introduction of new hardware and trends of large titles. Will DHH be able to continue to increase cash flows in this field by creating an efficient debugging system, while maintaining the flexible debugging needs support system, which is one of its features and strengths?

◉ The potential of integrated resorts (IR) in the amusement business

—In the amusement business, the market related to pachinko and pachislot customers (i.e., the company's target customers) is set to shrink in the long term. But gaming machines related to casinos could become a new market. Although the sharp drop in foreign tourists to Japan due to COVID-19 is an issue in the near term, will latent demand emerge in connection with casino gaming equipment accompanying the development of integrated resorts (IR)?

◉ Pros and cons of COVID-19

—Pros: Entertainment Business

The expansion of stay-at-home consumption after COVID-19 is expected to serve as a tailwind for the game industry. Will DHH be able to securely capture this demand?

—Pros: Enterprise Business

The rollout of DX projects ahead of schedule is expected to create special demand for testing and accelerate growth in the enterprise field.

—Cons:

1) Interruptions in client development work causing delays in debugging and system testing.
2) Unexpected costs arising from changes in the attendance system at Labs (i.e., test centers) and countermeasures against infectious diseases.
3) The overall sluggishness of economic activities leading to weaker demand for debugging and system testing.

Table of Contents

Note: The “company” in this report refers to DIGITAL HEARTS HOLDINGS regardless of the context. The numbers in figures may not be perfectly consistent due to how the source data is used and rounding.

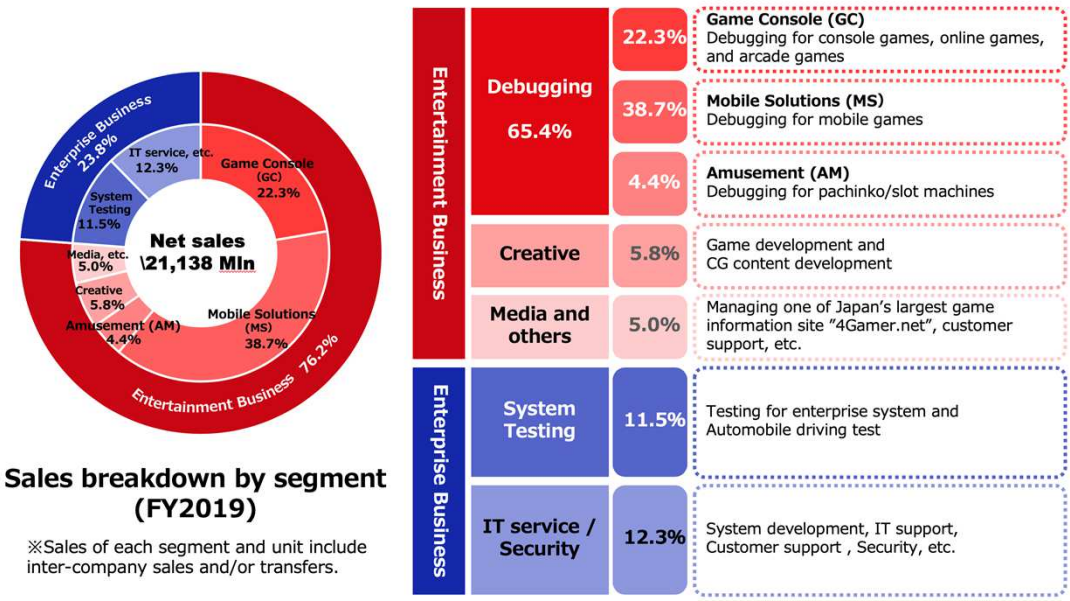
❸ Company Profile

1. Business summary

—Debugging is the mainstay service in the entertainment field. Recently focusing on system testing in the enterprise field.

The company was founded in 2001 by the current Director and Chairman, Eiichi Miyazawa, with the aim of providing debugging services to mainly detect bugs in games, and it has occupied a unique position as a pioneer among software testing specialists. Later, the company expanded its services from debugging in the entertainment field to system testing and security in the enterprise field. Recently, enterprise system testing and security services have been growing rapidly. The sales weighting of the Enterprise Business has been gradually increasing, with the sales ratio of Entertainment to Enterprise at 76.2% vs. 23.8% in FY3/20 (compared to 89.2% vs. 10.8% in FY3/17 and 82.8% vs. 17.2% in FY3/18; adjustments applied to FY3/17).

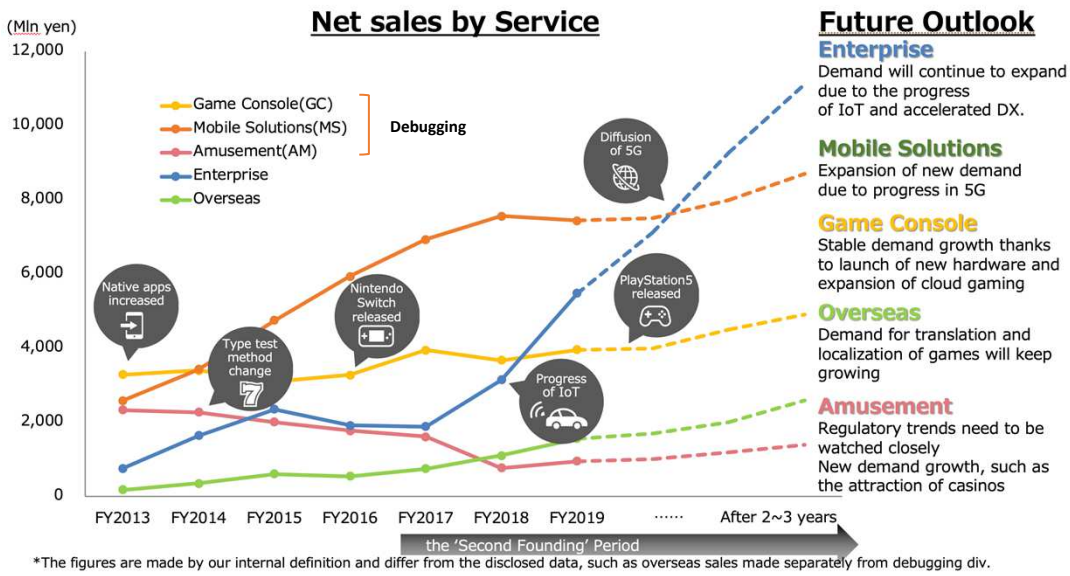
Service breakdown



Source: Company materials (Presentation Material for the Fiscal Year Ended March 31, 2020)

2. Recent trends and points of interest (snapshot)

The company's recent trends are shown in the figure on the next page. Details of individual services, market trends, and future developments will be described in later chapters. Since 2017, DHH has significantly steered the management focus to the Enterprise Business from the Entertainment Business. Progress on this front has been readily observable, underscoring the management team's delivery of results.

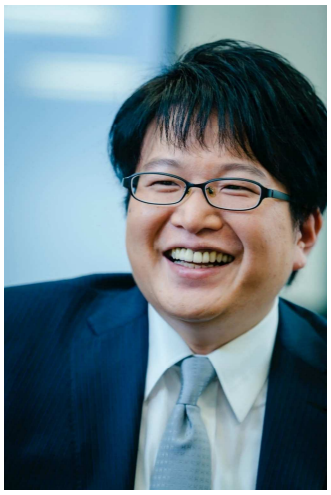


Source: Company materials (Presentation Material for the Fiscal Year Ended March 31, 2020)

DHH is beginning to realize its original growth story, where the Enterprise Business brings in additional revenue and significantly drives the company's growth, while debugging services for game consoles and mobile games serve as a stable business foundation. Future growth potential in the enterprise field, including security services, appears substantial. If the spread of 5G were to take definitive shape, services for mobile games may once again enter an uptrend .

3. History

In April 2001, Eiichi Miyazawa (current Director and Chairman) founded DIGITAL Hearts Ltd. to provide debugging services, mainly for the detection of bugs in games. As one of the pioneers in outsourced debugging services, the company was incorporated in October 2003. It steadily expanded earnings and was listed on the Mothers Market of the Tokyo Stock Exchange (TSE) in February 2008. In February 2011, it was listed on the First Section of the TSE. The company has continued to grow its business based on a track record in debugging and accumulation of technical expertise. Subsidiaries were established in South Korea, North America, and Thailand, as the company expanded overseas. In October 2013, it established Hearts United Group Co., Ltd. and transitioned to a pure holding company structure.



Founder Eiichi Miyazawa, Director and Chairman

Since then, the company accumulated system testing and security expertise in fields other than game debugging and made a full-scale entry into the enterprise field. In June 2017, it renewed the management system, appointing Founder Eiichi Miyazawa as Director and Chairman, and bringing onboard Genichi Tamatsuka (with past management experience at Fast Retailing and Lawson) as President & CEO. In the "Second Founding" period, the company has concentrated investments of management resources in the enterprise field under President Tamatsuka. It has focused on hiring personnel who excel in enterprise testing, retrained in-house personnel and turned them into viable assets, and made headway in tie-ups with external parties.

History

Year	Month	Overview
2001	Apr.	Established DIGITAL Hearts Ltd.
		Began offering debugging services, mainly for console games.
2002	Sep.	Obtained license for general worker dispatching business
2003	Oct.	Changed to DIGITAL HEARTS Co., Ltd.
2007	Sep.	Became the first Japanese company to receive the Authorized Xbox 360 Test Program (AXTP) from Microsoft Corporation for Xbox 360®.
	Oct.	Received “privacy mark” certification.
2008	Feb.	Listed on the Mothers Market of the Tokyo Stock Exchange.
2011	Feb.	Listed on the First Section of the Tokyo Stock Exchange.
	Jul.	Established consolidated subsidiary, DIGITAL Hearts Korea Co., Ltd., in South Korea.
	Oct.	Established consolidated subsidiary, DIGITAL Hearts USA Inc., in the United States.
	Dec.	Established consolidated subsidiary, DIGITAL Hearts (Thailand) Co., Ltd., in Thailand.
2012	Mar.	Established consolidated subsidiary, G&D Co., Ltd. Began offering outsourced services for game software development.
	May	Established consolidated subsidiary, DIGITAL Hearts Visual Co., Ltd. Separated 3D content production and incidental operations from the company.
	Nov.	Acquired all shares of Aetas, Inc. and made it a subsidiary. Started the media business that operates the comprehensive game information site, "4Gamer.net.”
2013	Oct.	Established a pure holding company, Hearts United Group Co., Ltd., by means of a stock transfer and transitioned to a pure holding company structure.
	Nov.	Acquired shares of NetWork21 Co., Ltd. and made it a subsidiary.
2014	Apr.	Acquired shares of Premium Agency Inc. and made it a subsidiary through subscription to a third-party allotment of shares.
2015	Jan.	Established a joint venture, ZEG Inc. (currently equity-method affiliate), with ZMP Inc.
2016	Jan.	Conducted a merger of G&D Co., Ltd., DIGITAL Hearts Visual Co., Ltd., and Premium Agency Inc., and newly established as FLAME Hearts Co., Ltd.
	Jul.	Established consolidated subsidiary, DIGITAL Hearts (Shanghai) Co., Ltd., in China.
2017	Jun.	Changed the management system, including the transfer of the representative director. Started the "Second Founding" period to accelerate business expansion in the enterprise field.
	Oct.	Conducted a merger of subsidiaries, DIGITAL Hearts Co., Ltd. and NetWork 21 Co., Ltd.
2018	Jul.	Changed the company name from Hearts United Group Co., Ltd. to DIGITAL HEARTS HOLDINGS Co., Ltd.
	Aug.	Acquired shares of ANET Corporation and made it a subsidiary.
2019	Jan.	Acquired shares of Orgosoft Co., Ltd. and made it a consolidated subsidiary.
	Aug.	Acquired shares of LogiGear Corporation and made it a subsidiary through subscription to a third-party allotment of shares.
	Nov.	Established a joint venture, Red Team Technologies Co., Ltd., with LAC Co., Ltd.
	Dec.	DIGITAL HEARTS Co., Ltd., a consolidated subsidiary, established a joint venture, Digital Hearts Linguitronics Taiwan Co., Ltd. in Taiwan, with Linguitronics Co., Ltd.

Source: Compiled by Sessa Partners from company materials

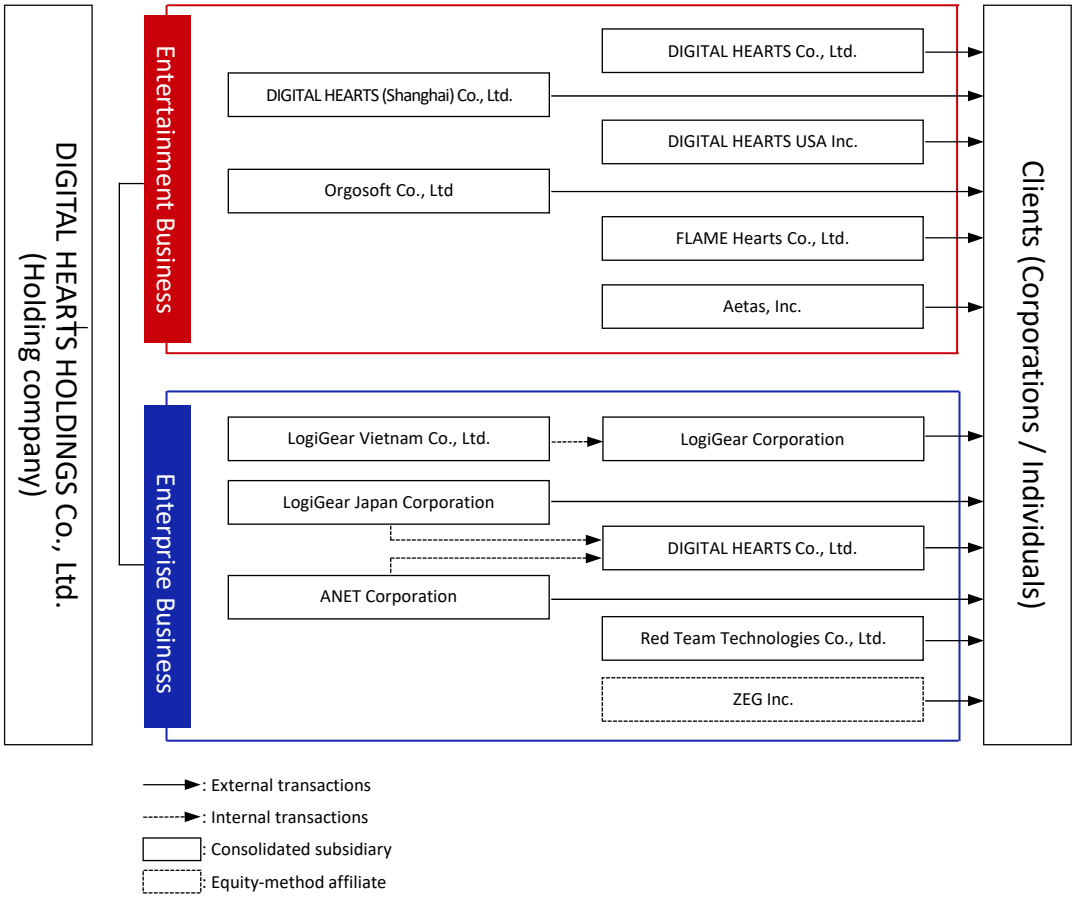
In August 2019, the company acquired LogiGear Corporation (“LogiGear”), which has a track record in software testing automation. The company also brought LogiGear's Vietnamese subsidiary under its umbrella, thereby acquiring around 500 test engineers.

In 2020, the company realized the launch of remote debugging services, which was difficult in the past due to security reasons, prompted by the spread of COVID-19. In addition, it has taken early measures in anticipation of the post-pandemic world, such as starting to rebuild the business ahead of schedule (more details later).

4. Group overview

The Group consists of pure holding company, DIGITAL HEARTS HOLDINGS Co., Ltd., and subsidiary, DIGITAL HEARTS Co., Ltd. (an operating company), along with a group of subsidiaries in which it owns a 49-100% stake. The core of earnings comes from DIGITAL HEARTS Co., Ltd., accounting for over 80% of consolidated sales. Related investments have been made to strengthen the enterprise field, and the company acquired LogiGear Corporation as part of these efforts, with the aim of utilizing LogiGear's knowledge and resources in testing automation for the entire Group. Given the company's plans to strengthen the Enterprise Business and international operations, it can be said that this was an epoch-making deal.

Overview of main group companies

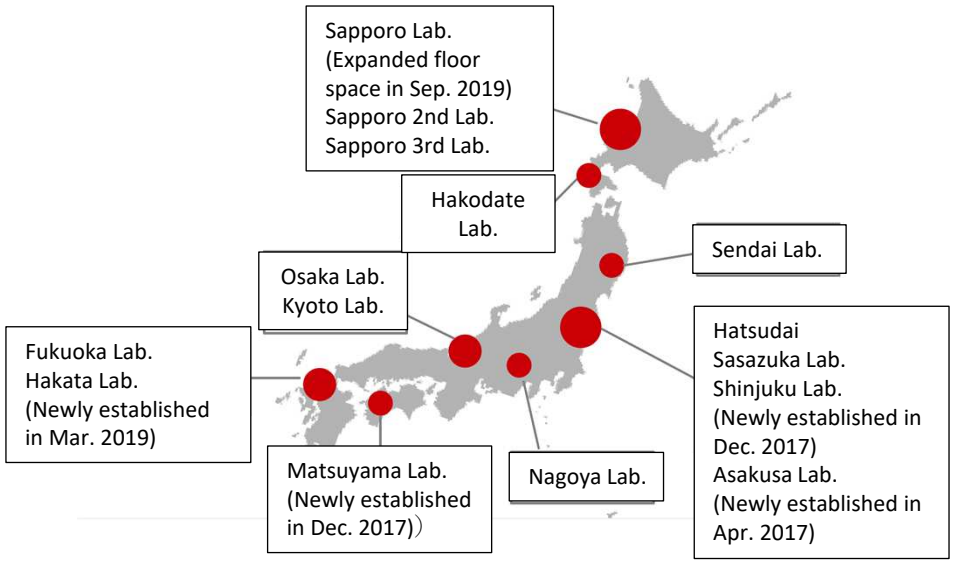


Source: Compiled by Sessa Partners from company materials (Fact Book 2020)

At end-March 2020, DHH decided to integrate LogiGear's test engineers enrolled at LogiGear's Vietnam subsidiary with Digital Hearts' Vietnam subsidiary. Also, in November 2019, it established a joint venture, Red Team Technologies Co., Ltd., with domestic security service major LAC Co., Ltd. (DHH 60% stake, LAC 40% stake). Red Team Technologies leverages leading cloud-based white hat hackers in niche domains to provide security services.

The company has about 8,000 registered testers, who function as the core members of the debugging service in the Entertainment Business, performing tests from 15 activity bases (Lab.*) in Japan. It has been actively creating new labs and expanding floor space in tandem with business expansion in recent years.

Test centers in Japan (Lab.): Expansion in recent years



Source: Compiled by Sessa Partners from company materials

Photo of testers working inside the Lab.

Source: Company materials

Glossary of Key Terms
*Lab.: Work base for debugging. Equipped with advanced security tools to protect the intellectual property of clients.

Entertainment Business earnings trend

JPY mm, %	FY2015/3	FY2016/3	FY2017/3	FY2018/3	FY2019/3	FY2020/3	CAGR 15/3-20/3
Net Sales	**13,285**	**15,011**	**15,444**	**17,353**	**19,254**	**21,138**	**9.7%**
YoY	*31.0%*	*13.0%*	*2.9%*	*12.4%*	*11.0%*	*9.8%*	
Entertainment	**11,609**	**12,696**	**13,544**	**15,568**	**15,951**	**16,115**	**6.8%**
YoY	*24.0%*	*9.4%*	*6.7%*	*14.9%*	*2.5%*	*1.0%*	
% of SLS	87.4%	84.6%	87.7%	89.7%	82.8%	76.2%	
Debugging	**9,430**	**10,454**	**11,524**	**13,186**	**13,103**	**13,823**	**7.9%**
YoY	*11.8%*	*10.9%*	*10.2%*	*14.4%*	*-0.6%*	*5.5%*	
% of SLS	71.0%	69.6%	74.6%	76.0%	68.1%	65.4%	
Game Console	**3,604**	**3,449**	**3,483**	**4,174**	**4,356**	**4,709**	**5.5%**
YoY	*6.3%*	*-4.3%*	*1.0%*	*19.8%*	*4.4%*	*8.1%*	
% of SLS	27.1%	23.0%	22.6%	24.1%	22.6%	22.3%	
Mobile Solutions	**3,554**	**4,994**	**6,262**	**7,399**	**8,172**	**8,173**	**18.1%**
YoY	*33.9%*	*40.5%*	*25.4%*	*18.2%*	*10.4%*	*0.0%*	
% of SLS	26.8%	33.3%	40.5%	42.6%	42.4%	38.7%	
Amusement	**2,272**	**2,012**	**1,778**	**1,612**	**775**	**939**	**-16.2%**
YoY	*-4.9%*	*-11.4%*	*-11.6%*	*-9.3%*	*-51.9%*	*21.2%*	
% of SLS	17.1%	13.4%	11.5%	9.3%	4.0%	4.4%	
Creative	**1,675**	**1,729**	**1,465**	**1,743**	**1,891**	**1,226**	**-6.1%**
YoY	*279.0%*	*3.2%*	*-15.3%*	*19.0%*	*8.5%*	*-35.2%*	
% of SLS	12.6%	11.5%	9.5%	10.0%	9.8%	5.8%	
Media and others	**504**	**512**	**554**	**638**	**956**	**1,066**	**16.2%**
YoY	*4.3%*	*1.6%*	*8.2%*	*15.2%*	*49.8%*	*11.5%*	
% of SLS	3.8%	3.4%	3.6%	3.7%	5.0%	5.0%	
Operating Income	**1,517**	**1,963**	**1,906**	**1,735**	**1,605**	**1,394**	**-1.7%**
YoY	*-14.8%*	*29.4%*	*-2.9%*	*-9.0%*	*-7.5%*	*-13.1%*	
% of SLS	11.4%	13.1%	12.3%	10.0%	8.3%	6.6%	
Entertainment	**1,915**	**2,379**	**2,453**	**2,966**	**3,086**	**2,964**	**9.1%**
YoY	*--*	*24.2%*	*3.1%*	*20.9%*	*4.0%*	*-4.0%*	
% of Seg.SLS	16.5%	18.7%	18.1%	19.1%	19.3%	18.4%	
% of OP	126.2%	121.2%	128.7%	171.0%	192.3%	212.6%	

Source: Compiled by SESSA Partners from company materials

5. Service content and features

1) Entertainment Business

As DHH's founding business, the Entertainment Business started as a debugging service for game consoles. Back then, it was uncommon for game developers to outsource debugging, but the company was regarded highly by major client firms for its specialization in debugging, accumulated know-how, and refined skills. DHH proved the viability of third-party debugging and its high cost-effectiveness. The spread of video game platforms like Nintendo and SONY PlayStation prompted many firms to enter game development. But game development is subject to large investment capital and high risk accompanying the uncertainty of popularity. By specializing in debugging, which others had not focused on, DHH occupied a unique position in the software services market. In addition to home-use game consoles, it later broadened the business scope to services for pachinko and pachislots, as well as games and apps for mobile devices, which have expanded rapidly in recent years.

The Entertainment Business breaks down into the following services: a) debugging, b) creative, and c) media and others.

a) Debugging

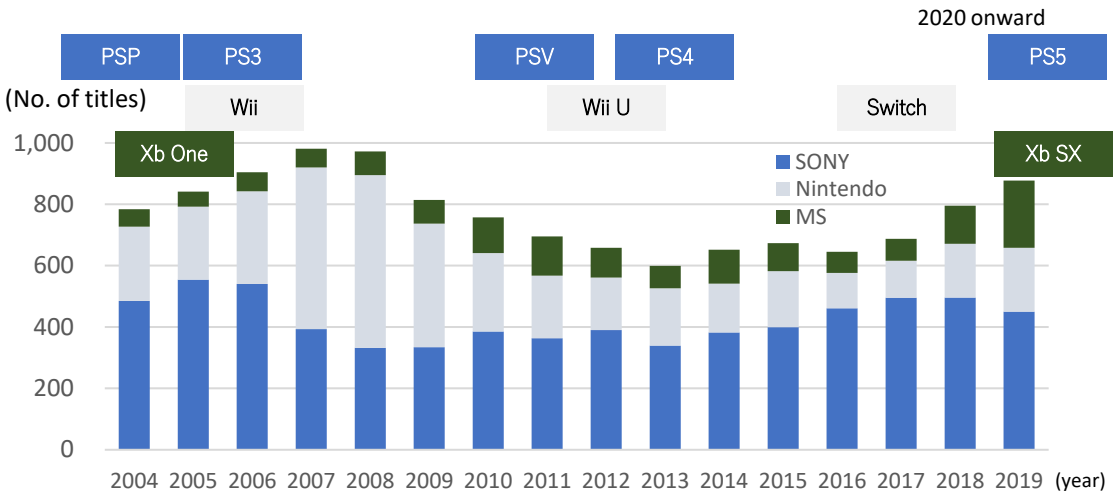
Debugging is a service to check for bugs in pre-release software and report the results to customers. The company thoroughly checks whether the software functions as expected when operated under normal procedures, and whether bugs are detected when operated in unexpected ways. Note that DHH isn't in charge of fixing the bugs. Its strength is in discovering the bugs from the user's perspective that are hidden in game software and difficult to notice from the developer's perspective. The company has many testers who have extensive know-how in debugging and excel in different fields, allowing it to respond flexibly to client needs (the required skillset varies depending on the type of game, such as RPG, sports, or car racing).

Debugging can be further divided into i) game console (GC; testing of home-use games, online games, arcade games, etc.), ii) mobile solution (MS; mobile game testing), and iii) amusement (AM: pachinko and pachislot testing).

i) Game console (GC)

GC comprises debugging for home-use games, online games, and arcade games, mainly of Nintendo, SONY PlayStation, and Microsoft Xbox. GC was the origin of the company's debugging service. While the domestic market for home-use game consoles is almost mature, new hardware releases will spawn new game titles and thereby expand the market.

Sales volume of game software titles in Japan



Source: Compiled by Sessa Partners from various information sources

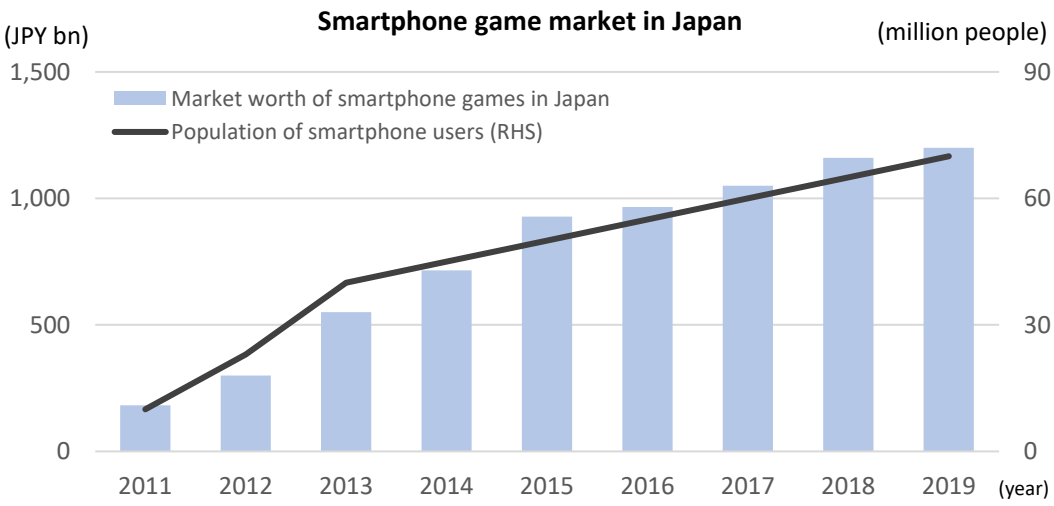
When debugging a console game, pre-release titles are high confidential, and very strict security must be in place. In addition, the business must have a license to purchase equipment for debugging. As a result, a relationship of trust with clients is very important, and this functions as a barrier to entry for new companies. Also, in recent years, the high functionality of hardware (accelerated GPU for high-definition 3DCG, VR, etc.) and online games has required large amounts of capital and many skilled human resources. Generally, the development company concentrates on the development of the game itself, while the debugging is outsourced to DHH and other external debugging specialists.

In Japan, the only companies capable of meeting such advanced client needs are DHH and competitor, Pole To Win Co., Ltd. (subsidiary of Poletowin Pitcrew Holdings Inc., TYO:3657). Consequently, the company's GC service has delivered stable growth, with a **CAGR of 5.5% from FY3/15 to FY3/20,** by accurately capturing the outsourcing needs for debugging.

ii) Mobile solution (MS)

Home video game consoles appeared in the 1980s, and the market has already matured. The market for mobile games and apps, premised on usage on mobile devices like smartphones and tablets, only took shape after the launch of the first iPhone (in Japan, 2008 onward after iPhone 3G's release). In the last 10 years, the penetration rate of smartphones has reached 80%, and the market for games and social games on smartphones and tablets has grown rapidly, exceeding ¥1 trillion in 2017.

Market worth of smartphone games in Japan surpassed ¥1 trillion



Source: Compiled by Sessa Partners from MIC's "White Paper on Information and Communications" and "Famitsu Game White Paper"

A difference between mobile solutions and traditional game consoles is that, constant online updates make it easier to extend features and fix bugs in mobile solutions. Thus, compared to the game console debugging service (which terminate as soon as the title is released), mobile solutions are more likely to lead to a continuous business stream. By leveraging its know-how in traditional debugging services, the company has acquired prominent customers in mobile solutions, resulting in the service's rapid expansion at a **CAGR of 18.1%** in the last five years.

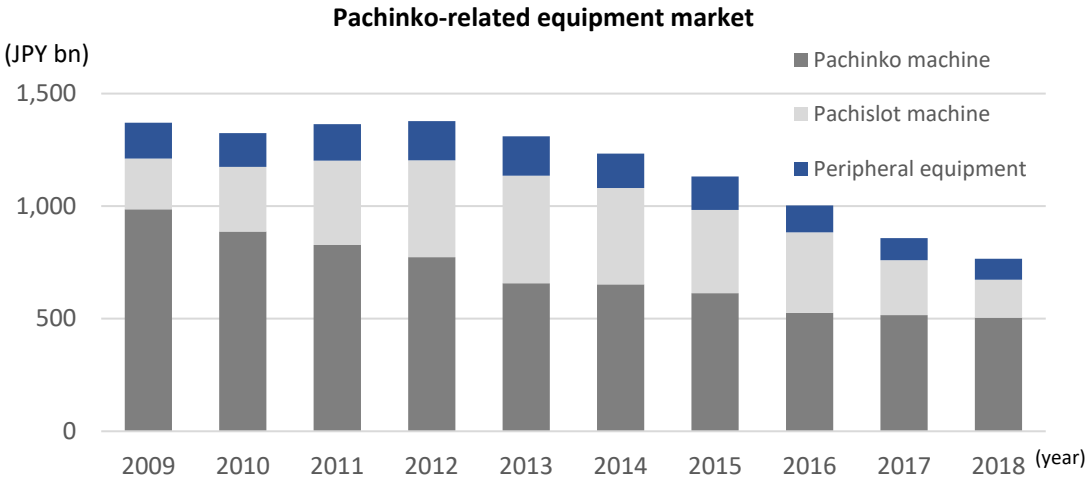
iii) Amusement (AM)

AM comprises debugging services for pachinko and pachislot machines. Since this field is subject to the Amusement Businesses Act, it is impacted by amendments to the Act. Moreover, unlike in the Showa period, pachinko and pachislot as a form of entertainment are on a long-term downtrend, as various other leisure options continue to expand. The pachinko-related market size that was once said to be ¥30 trillion has now shrunk to ¥20 trillion (source: Japan Productivity Center, "White Paper on Leisure Industry").

In addition, the pachinko-related equipment market has continued to contract, and the gaming machines market has been sluggish since the enforcement of stricter regulations in February 2018 to counter problem gambling. Although AM once accounted for over 20% of the company's total sales, the most recent figures show that this has fallen to the single digit.

Going forward, the development of integrated resorts (IR) may fuel the need for debugging of gaming machines at casinos. Although the COVID-19 outbreak has led to a sharp drop in foreign tourists of late, developments on the IR front continue to merit attention.

Dwindling gaming machines market



Source: Yano Research Institute, "Trend and Market Share of Pachinko-related Makers 2019"

b) Creative

The creative service supports production in all creative areas of content production, such as game development and 2D/3D graphic production. A subsidiary, FLAME Hearts, handles part of the UI and character design of series like Final Fantasy and Pokémon by major game makers. DHH aims to enhance customer engagement through this service, but revenues have been heavily swayed by the status of development requests from customers.

c) Media and others

Media and others comprise services provided by subsidiaries Aetas (operates Japan's largest comprehensive game information site 4Gamer.net) and DIGITAL HEARTS (offers customer support services). As with creative services, DHH aims to increase customer engagement through game-related support. In recent years, it has started offering customer support to increase revenues, in addition to improving the information quality and value of its media.

2) Enterprise Business

In the Enterprise Business, DHH provides the following services: system testing and contract development for enterprise systems, IT support (e.g., help desks), and cyber security.

Enterprise Business earnings trend

JPY mm, %	FY2015/3	FY2016/3	FY2017/3	FY2018/3	FY2019/3	FY2020/3	CAGR 15/3-20/3
Net Sales	**13,285**	**15,011**	**15,444**	**17,353**	**19,254**	**21,138**	**9.7%**
YoY	*31.0%*	*13.0%*	*2.9%*	*12.4%*	*11.0%*	*9.8%*	
Enterprise	**1,713**	**2,382**	**1,952**	**1,878**	**3,302**	**5,022**	**24.0%**
YoY	*114.7%*	*39.1%*	*-18.1%*	*-3.8%*	*75.8%*	*52.1%*	
% of SLS	12.9%	15.9%	12.6%	10.8%	17.1%	23.8%	
System Testing	**380**	**681**	**778**	**1,084**	**1,395**	**2,414**	**44.7%**
YoY	*5.6%*	*79.2%*	*14.2%*	*39.3%*	*28.7%*	*73.0%*	
% of SLS	2.9%	4.5%	5.0%	6.2%	7.2%	11.4%	
IT Service / Security	**1,333**	**1,701**	**1,193**	**808**	**1,907**	**2,608**	**14.4%**
YoY	*204.3%*	*27.6%*	*-29.9%*	*-32.3%*	*136.0%*	*36.8%*	
% of SLS	10.0%	11.3%	7.7%	4.7%	9.9%	12.3%	
Operating Income	**1,517**	**1,963**	**1,906**	**1,735**	**1,605**	**1,394**	**-1.7%**
YoY	*-14.8%*	*29.4%*	*-2.9%*	*-9.0%*	*-7.5%*	*-13.1%*	
% of SLS	11.4%	13.1%	12.3%	10.0%	8.3%	6.6%	
Enterprise	**50**	**71**	**203**	**(14)**	**(226)**	**(67)**	**--**
YoY	*--*	*42.0%*	*185.9%*	*--*	*--*	*--*	
% of Seg.SLS	2.9%	3.0%	10.4%	-0.7%	-6.8%	-1.3%	
% of OP	3.3%	3.6%	10.7%	-0.8%	-14.1%	-4.8%	

Source: Compiled by Sessa Partners from company materials

In the Entertainment Business, DHH has accumulated knowledge and know-how in detecting bugs in games. More recently, it has focused on the enterprise field to leverage this expertise and expand new growth opportunities. However, system tests in the enterprise field stand in stark contrast to the entertainment field in terms of customer base. The enterprise field also requires a higher level of system testing knowledge and skills. Accordingly, DHH has been shifting company's resources into the enterprise field and making various investments.

Demand for the development of enterprise systems is strong in society, particularly due to the recent recognition of DX as an urgent issue, along with the adoption of ICT in society and corporate initiative to secure and strengthen competitiveness. Meanwhile, Japan has especially suffered from shortages in IT personnel (e.g., software engineers, programmers). As a result, major manufacturers of computers, home appliances, and cars, as well as system integrators have moved to outsource system testing, while allocating in-house engineers to key development activities to maintain development capacity. Also, system engineers tend to have a penchant for development but lack interest in testing. Moreover, software quality assurance requires skills different from development. It is thus more efficient for software testing to be outsourced to a third-party specialist in order to ensure higher quality.

While DHH has around 8,000 registered testers who perform debugging in the Entertainment Business, it also discovers and trains personnel with potential as an enterprise test engineer out of those testers, to develop engineers with the skills to propose solutions to clients. This talent pool has benefitted the company greatly upon shifting focus to the enterprise field. As part of improving personnel quality, DHH promotes the acquisition of JSTQB* certification. In addition to being a Platinum Partner, it has more than 300 engineers who possess JSTQB certification.

Glossary of Key Terms
*JSTQB (Japan Software Testing Qualification Board): A member organization of ISTQB, which is a software testing certification board that operates internationally.

Also, DHH looks to gain an edge through M&A and tie-ups, since it takes time to develop personnel on their own. It made LogiGear Corporation a subsidiary in line with this strategy.

M&A and tie-ups in the enterprise field

Month and Year	Company	Description
Nov. 2019	Established Red Team Technologies	Joint venture with LAC Co., Ltd. that provides a white hat hacker service in response to cyber security needs
Aug. 2019	Acquired LogiGear Group	・Leading company in system testing with a 25-year track record in Silicon Valley ・Possesses a proprietary test automation tool ・Has approx. 500 automation engineers in Vietnam
Aug. 2018	Formed a tie-up with VALTES	Aims for the early training of test engineers through a partnership with VALTES, which excels in the enterprise field
Aug. 2018	Made ANET a subsidiary	Operates a test business that excels in medical device testing
Jul. 2017	Formed a capital and business tie-up with HEROZ	Service development utilizing AI in software testing

Source: Compiled by SESSA Partners from company materials

In addition, the company has stepped up hiring activities of high-level personnel with experience in the enterprise field. DHH has particularly strengthened its knowledge and personnel network in the enterprise field by hiring "super engineers"—such as CTO Kunihiro Ishiguro (widely recognized as a developer of the commercial version of Zebra, "ZebOS"; has entrepreneurial experience in Silicon Valley) and CTSO (Chief Testing Solution Officer) Juichi Takahashi (has a doctorate in software testing; played key roles at Microsoft, SAP, and Sony).

a) System testing

In system testing, DHH mainly provides services to detect bugs in enterprise systems. Specifically, it provides continuous testing, such as test consulting in the development process, execution of various tests (e.g., functional, performance, user, and security tests), operation management, and evaluation improvement. In addition, equity-method affiliate ZEG Inc. (joint venture with ZMP Inc.) provides car driving test and data collection services.

Since 2017, to strengthen business in system testing, DHH has pushed to cultivate new customers and expand the transaction size per company. As a result, system testing sales surged, from ¥758mn in FY3/17 to ¥2,414mn in FY3/20, i.e., **a three-fold growth in three years**.

b) IT service and security

In IT service and security, DHH offers outsourced system development and IT services, along with security services that have become increasingly important in recent years. Since this is a relatively new service field, the company is leveraging tie-ups with external parties to build and strengthen services.

Security-related services include DH-MDR and DH-SOC. DH-MDR is a service to detect, analyze, and respond to security breaches, while DH-SOC is a service to diagnose system vulnerabilities provided by a specialized in-house security monitoring team. In November 2019, the company established Red Team Technologies to strengthen the sales structure for crowdsourced penetration test services. In these services, vulnerabilities are detected through simulated server attacks conducted by the world's top-level white hat hackers provided by Synack, Inc.

As in system testing, sales for IT service and security have grown robustly, and an ongoing significant expansion can be expected especially in the security field.

Glossary of Key Terms
*Software testing: Here, software testing includes testing in both the entertainment and enterprise fields. Note that, as stated above, DHH distinguishes testing in the entertainment field as "debugging" and testing in the enterprise field as "system testing."

❹ Market Analysis

1. Key players in the software testing* market and competitive analysis

The five major software testing companies are as follows: a) DIGITAL HEARTS HOLDINGS (DHH), b) Poletowin Pitcrew Holdings, c) SHIFT, d) VALTES, and e) VeriServe. See the figures and tables on the next page for the basic data and features of each company.

The upper diagram on the next page shows the positioning of each software testing company. In the entertainment field, DHH and Poletowin enjoy a virtual oligopoly. While DHH is strong in game consoles, Poletowin excels in amusement. As stated above, the entertainment market is a stable growth market. As such, DHH's growth rate is not as high as the other three companies, which mainly focus on the enterprise market.

Meanwhile, system testing in the enterprise field has shown robust growth, driven by rising demand for outsourced software testing. Major listed firms in this field are SHIFT and VALTES.

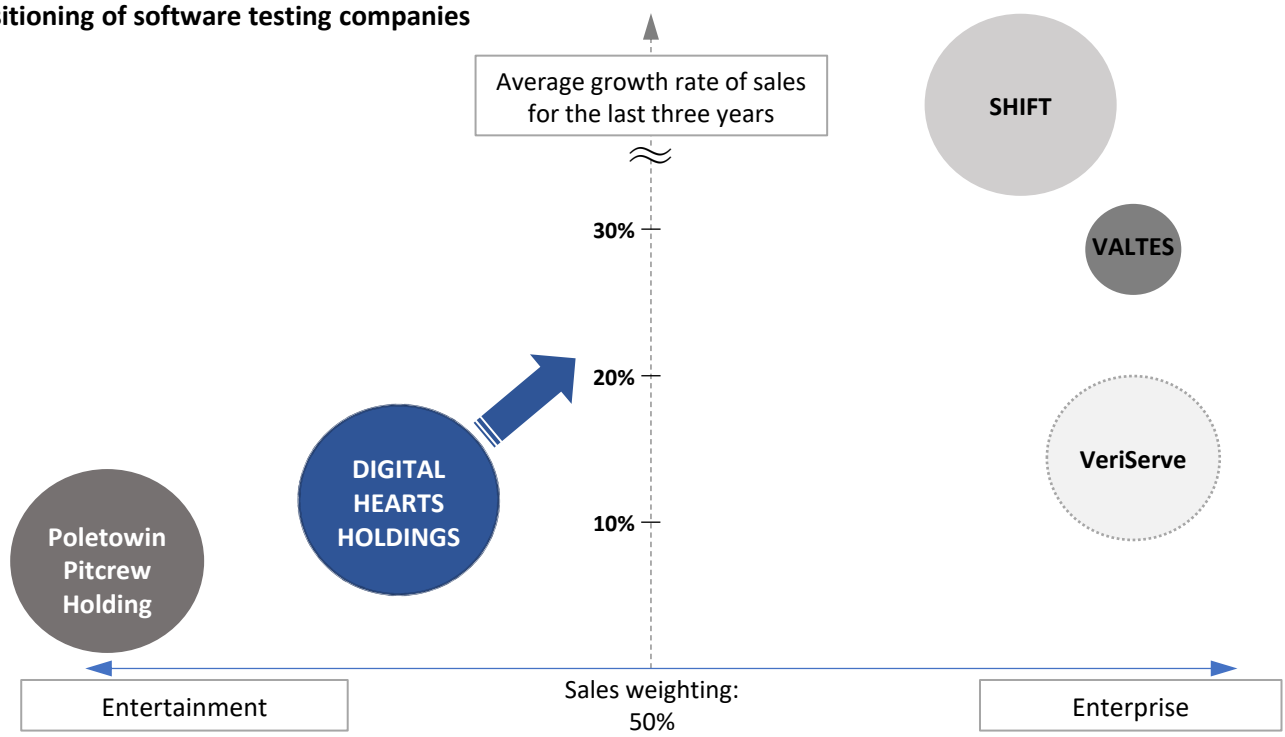
SHIFT's sales break down as 90% enterprise and 10% entertainment. SHIFT launched its software testing business in 2009 and has rapidly expanded the business through aggressive M&A and large-scale hiring of human resources.

VALTES was listed on the Mothers Market of the TSE in May 2019. Specializing in the enterprise field, VALTES has recently focused on upstream processes to provide high value-added services. DHH formed a tie-up with VALTES to receive help in training personnel in the enterprise field.

VeriServe became a wholly-owned subsidiary of SCSK Corporation in April 2019 through a takeover bid and was delisted. It focuses on enterprise testing and is particularly strong in the auto industry. VeriServe's history spans nearly 40 years, from the time it was still a business division of CSK (currently SCSK), and its technical capabilities are regarded highly.

DHH's current position in the software testing market is as described above. However, it aims to expand its business portfolio supported by stable revenues in the Entertainment Business and achieve high top-line growth (shift to the top right corner ↗ in the figure on the next page).

Positioning of software testing companies



Note: Prepared with reference to each company's securities reports. For Poletowin, we used the data of the Testing Services and Verification & Evaluation Business of Poletowin Pitcrew Holdings. The size of the circles is proportional to the most recent sales figure.
Source: Compiled by SESSA Partners from company securities reports and other materials

Comparison of software testing companies **(Unit: JPY mn)**

Code	3676	3657	3697	4442	Unlisted
Company name	DIGITAL HEARTS HOLDINGS	Poletowin Pitcrew Holding	SHIFT	VALTES	VeriServe
[Fiscal period]	FY3/20	FY1/20	FY8/19	FY3/20	FY3/20
Sales	**21,138**	**26,120**	**19,531**	**4,875**	**15,767**
3-year growth rate	*11.0%*	*10.0%*	*52.5%*	*28.6%*	*14.3%*
Operating profit	**1,394**	**3,531**	**1,541**	**322**	**1,880**
3-year growth rate	*-9.9%*	*13.6%*	*43.8%*	*51.8%*	*9.9%*
Operating profit	**6.6%**	**13.5%**	**7.9%**	**6.6%**	**11.9%**
Number of employees at term-end	**1,330**	**1,813**	**2,001**	**383**	**1,150**
3-year growth rate	*27.1%*	*10.2%*	*60.6%*	*22.2%*	*20.8%*
Sales per employee	**15,893**	**14.407**	**9.761**	**12.728**	**13.710**
Feature	Strong in game console testing in the entertainment field. Focusing on the enterprise field in the "Second Founding" period. ISTQB Platinum Partner.	Pole to Win, a subsidiary, provides debugging services in the entertainment field. Strong in amusement-related testing.	Mostly operates in the enterprise field. Rapidly expanding business through aggressive M&A. Entertainment field accounts for 10% of sales.	Software testing specialist for the enterprise field. Track record in distribution, retail, and embedded systems. ISTQB Global Partner.	Providing software testing since the 1980s. Specialist in the enterprise field. Auto-related testing accounts for more than half of sales. ISTQB Platinum Partner.

Note: Securities reports of each company. For Poletowin Pitcrew Holdings, segments other than software testing are also included, so the average growth rate of sales varies from the figure above.

Source: SESSA Partners from company securities reports and other data

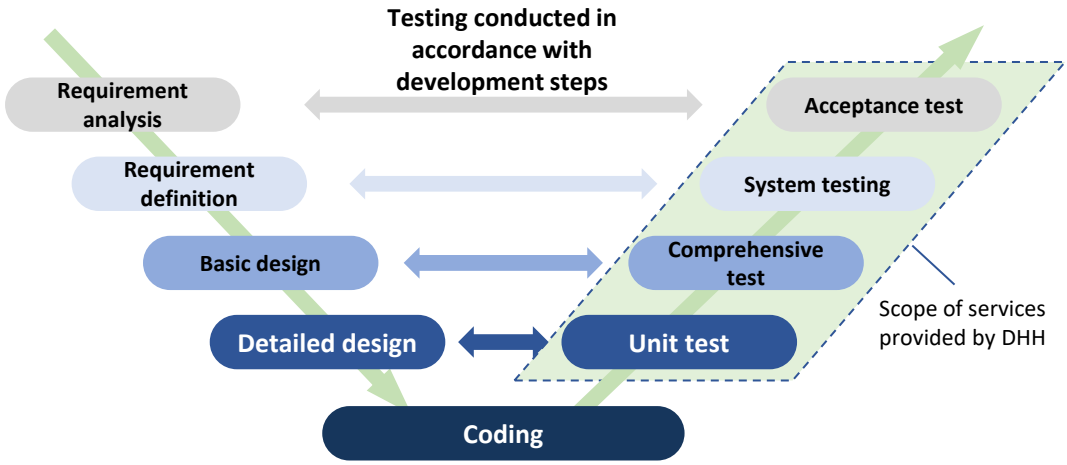
2. Market size of enterprise system testing

1) Software quality control (QC) and outsourcing

Software bugs cannot be eliminated completely. In recent years, it has become even more difficult to build a perfect system, as the number of coding steps increases and networks become connected. But the consequence of problems in a social infrastructure system can be immeasurable. For instance, an unstable ATM system at financial institutions would seriously hinder daily life, and software bugs in a jet airliner system could cause the loss of many lives. Going forward, it is without question that there will be an increased need for even more precise system tests in order to raise the quality of software.

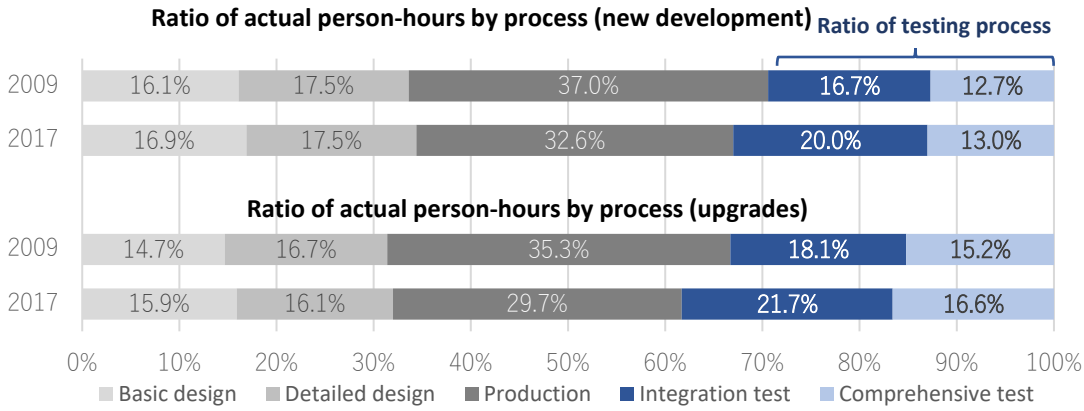
Software development companies conduct the following steps when developing software: requirement definition → basic design → detailed design → coding. These steps are typically performed according to customer requests, and in-house testing is conducted for each step, before delivery to the customer (see figure below). But large code bases in software expose the process to an increased likelihood of bugs, making QC a crucial issue. Although analysis tools for testing have been developed, in the final analysis, human checks are indispensable.

V-shaped model of software development & testing



Source: Compiled by Sessa Partners from various information sources

Meanwhile, software development companies often do not have the internal resources to conduct testing on their own, due to the increasing gravity in the shortage of software engineers (to be exact, this stems in large part from a mismatch in the skills offered by engineers versus the skills required). Under such circumstances, companies specializing in software testing have expanded their businesses by providing outsourced services of software testing. These companies use approaches as illustrated in the V-shaped model above to grasp the customer's design intent before performing the testing.

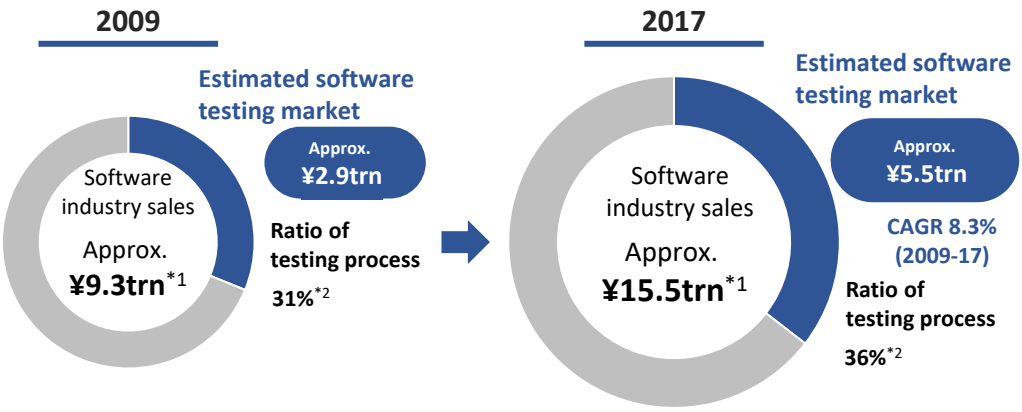


Source: Compiled by Sessa Partners from Information-technology Promotion Agency (IPA), "White Paper on Software Development Metric Data 2018-2019" and "White Paper on Software Development Metric Data 2010-2011"

2) Estimation of market size suggests large potential for growth

The ratio of time spent on each process in software development is as shown in the figure above, according to the White Paper on Software Development Metric Data. The ratio of the testing process (total of integration and comprehensive tests), as per actual person-hours by process in 2017, accounted for 36% of the total man-hours on average for new and upgrade development, up from 31% in 2009. Software industry sales expanded from ¥9.3trn in 2009 to ¥15.5trn in 2017. By multiplying this amount with the software testing process ratio, the market size for software testing in 2017 can be estimated as approx. ¥5.5 trillion (CAGR of 8.3% for 2009-17). Currently, most testing is done in-house by manufacturers, carriers, system integrators, and others. A simple sum of sales at the five software testing firms in this report amounts to less than ¥100.0bn, or about 1-2% of the market size. That said, not all the testing process is outsourced, and even a generous estimation suggests only 30-40% is outsourced when referring to the example of the US and others. Still, when comparing the potential market size and the current sales at each company, there appears to be considerable room for growth.

Estimation of the Japanese software testing market



Source: Compiled by Sessa partners from *1 MIC and METI, "Basic Survey on the Information and Communications Industry" and *2 Information-technology Promotion Agency (IPA), "White Paper on Software Development Metric Data 2018-2019" and "White Paper on Software Development Metric Data 2010-2011"

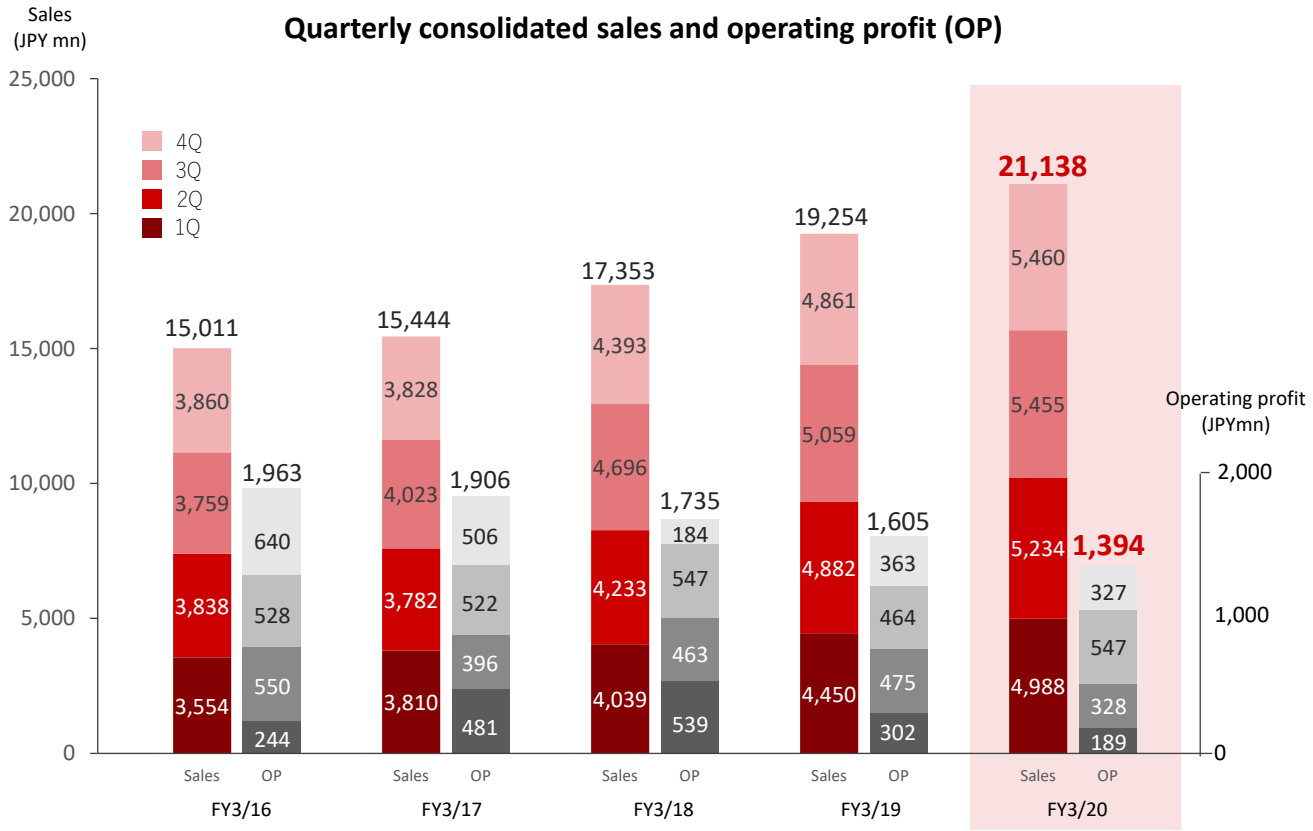
❺ Earnings Trend

1. Consolidated results for FY3/20

◇ Sales grew by 9% and hit a new record. Although profit dropped by 49% due to the booking of an extraordinary loss, if extraordinary income and loss are factored out, profit came in roughly on par with a year earlier.

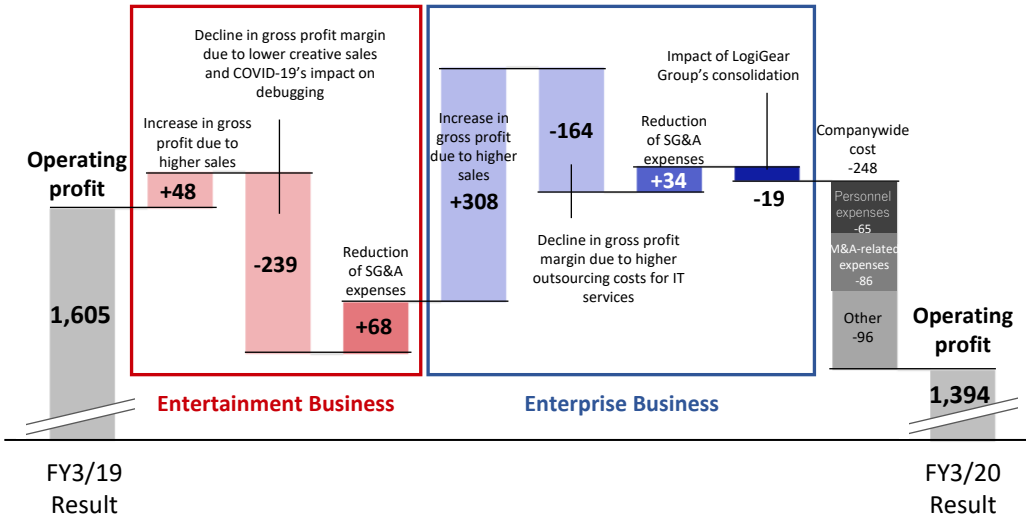
For FY3/20, sales were ¥21,138mn (+9.8% YoY), operating profit was ¥1,394mn (-13.2% YoY), ordinary profit was ¥1,372mn (-16.9% YoY), and profit attributable to owners of parent was ¥792mn (-49.7% YoY). Sales hit a new record, with Entertainment Business sales posting ¥16,115mn (+1.0% YoY), and Enterprise Business sales climbing to ¥5,022mn (+52.1% YoY).

Development delays occurred for client game titles in 4Q due to the impact of COVID-19, resulting in missing the sales target, mainly in the high-margin Entertainment Business. As a result, operating profit was also pushed down. In addition, the company took measures against the risk of a long-term economic downturn caused by COVID-19's spread and responded to the adoption of new ways of work. It implemented structural reforms ahead of schedule, including the closure of the Shinjuku Lab. and the integration of Vietnamese bases, as part of its push to optimize the operational balance of bases. It booked an extraordinary loss of ¥75mn related to these reforms. Profit roughly halved compared to FY3/19, partly due to the dropout of an extraordinary income of ¥733mn booked in FY3/19. However, if the impact of extraordinary income and loss is factored out, profit was roughly on par with FY3/19.



Source: Company materials (Presentation Material for the Fiscal Year Ended March 31, 2020)

Analysis of operating profit



Source: Company materials (Presentation Material for the Fiscal Year Ended March 31, 2020)

Although the company fell short of the initial guidance by 8% for sales and 22% for operating profit, it finished in line with the revised earnings forecast announced on April 24.

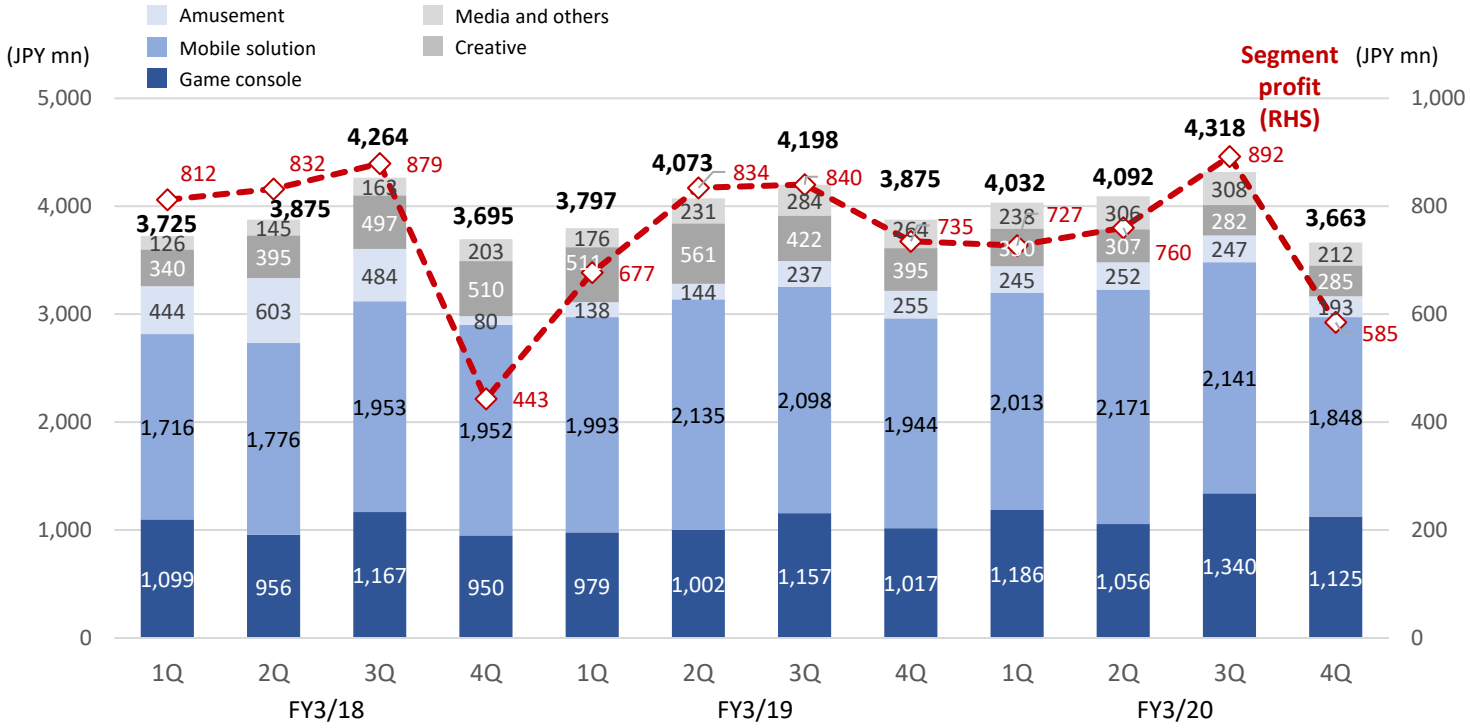
In comparison with operating profit in FY3/19, the Entertainment Business saw a ¥121mn drop in profit, mainly due to a fall in the gross profit margin (-¥239mn) caused by lower sales in creative and COVID-19's impact on debugging. In the Enterprise Business, higher sales led to increased gross profit (+¥308mn), but a rise in outsourcing expenses resulted in a lower gross profit margin for IT services (-¥164mn). In addition, operating profit decreased by ¥248mn due to a rise in personnel expenses (-¥65mn) and M&A-related expenses (-¥86mn) as company-wide expenses. On net, operating profit declined by ¥211mn, or 13.2%.

◇Results by segment

○ Entertainment Business (sales: ¥16,115mn, +1.0% YoY)

Segment sales held steady until 3Q, maintaining growth of 2.9% YoY. But sales fell sharply in 4Q due to COVID-19's impact on mobile solutions, resulting in negative YoY growth for non-game console services. As a result, although the Entertainment Business logged a slight uptick in sales for the full year, it booked a 5.5% YoY decline in 4Q alone. Segment profit fell 4.0% YoY, due to a decrease in creative sales and a lower gross profit margin for debugging, as explained earlier.

Entertainment Business: Quarterly sales and segment profit



Source: Compiled by Sessa Partners from company materials (summary of financial results, earnings presentation)

—Debugging (sales: ¥13,823mn, +5.5% YoY)

Debugging, which accounts for over 80% of sales in the Entertainment Business, performed robustly centering on game consoles until 3Q. Debugging sales rose 5.5% YoY for the full year, despite a 1.6% YoY drop in 4Q sales due to the impact of COVID-19. Game console sales increased 13.3% YoY thanks to multiple large-title orders, and set a record high. Mobile solution sales were on par with last year, despite a YoY drop in 4Q sales owing to the impact of COVID-19. Amusement sales fell significantly below past levels, though they have entered a recovery trend since slumping in response to tigether industry regulations. On May 14, the National Police Agency announced it will extend the deadline for the removal of old regulated machines (previously until January 2021) by one year, considering the impact of COVID-19. In view of the further delay in machine updates, the amusement business likely continues to warrant caution.

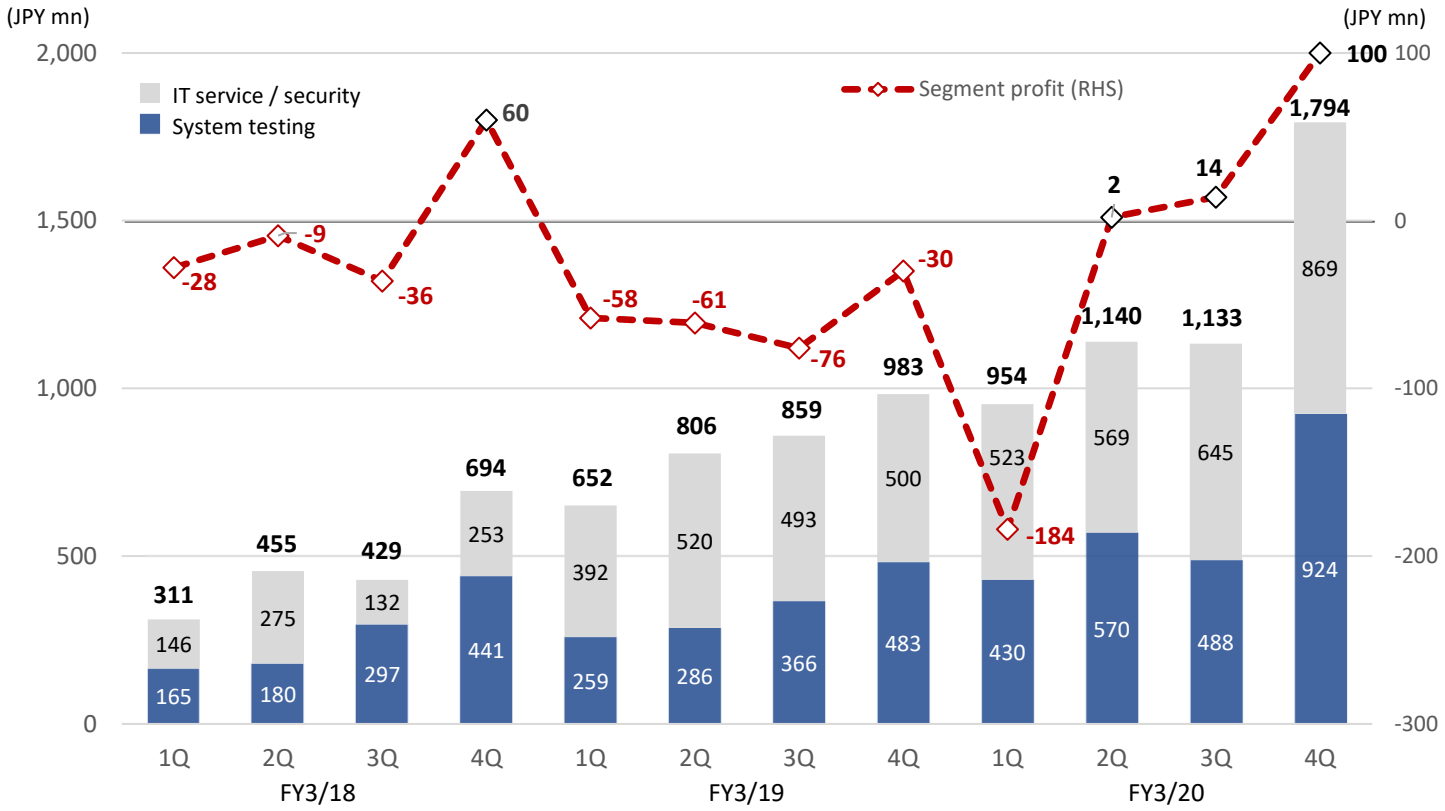
—Creative (sales: ¥1,226mn, -35.2% YoY)

Sales remained firm for 2D/3D graphic production, but overall sales declined sharply, as game contract development projects slumped due to the slowing growth of the mobile game market.

—Media and others (sales: ¥1,066mn, +11.5% YoY)

In addition to distributing high-value-added information on the comprehensive game information site "4Gamer.net" and improving the media value, the company acquired customer support service projects. As a result, sales increased by 11.5% YoY.

Enterprise Business: Quarterly sales and segment profit



Source: Compiled by Sessa Partners from company materials (summary of financial results, earnings presentation)

○ Enterprise business (¥5,022mn, +52.1% YoY)

—System testing (sales: ¥2,414mn, +73.0% YoY)

System testing sales grew by roughly 50% YoY on an existing business basis, bolstered by progress in new customer cultivation and expansion of transaction size per company. Also, revenue contributions from LogiGear Group, which was turned into a subsidiary in August 2019, starting in 4Q (approx. ¥350+mn) drove a sharp full-year increase in sales by 73.0% YoY.

—IT service and security (sales: ¥2,608mn, +36.7% YoY)

Sales for system contract development were solid. For security services, the company received new project orders from both large firms and SMEs, supported by the heightened awareness of companies regarding network system safety.

As a result, Enterprise Business sales surged to ¥5,022mn (+52.1% YoY). Although large investments accompanying a shift in business model pushed segment profit into the red for the full year, the segment turned profitable since 2Q on a quarterly basis. Compared to FY3/19, segment profit improved by ¥159mn for the full year.

❻ Future Outlook

1. Medium-to long-term roadmap

1) Numerical targets for "Second Founding“ period: Sales of ¥50.0bn, EBITDA of ¥10.0bn

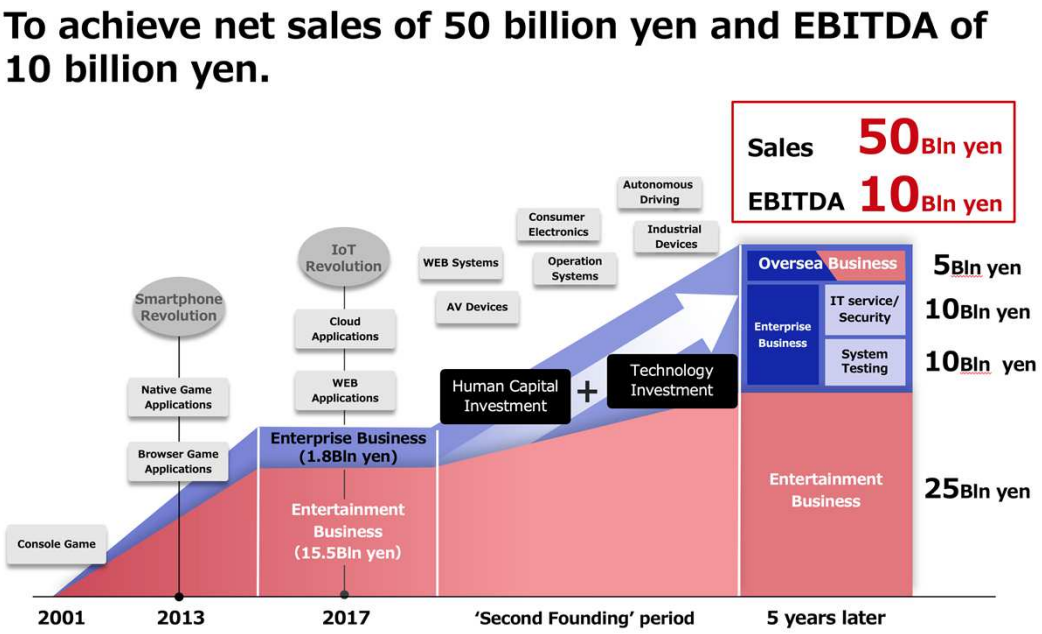
The company aims to become **“Asia’s No. 1 comprehensive test solutions provider,”** targeting growth in the fields of debugging, system testing, and security through a combination of human resources and technology. As a medium-to long-term roadmap, DHH looks to achieve numerical targets of ¥50.0bn in sales and ¥10.0bn in EBITDA several years into the "Second Founding" period. The key to realizing these goals will be growth in the Enterprise Business, which it has focused on since 2017, and the company plans to generate ¥20.0bn in sales from the Enterprise Business out of the ¥50.0bn in total sales.

In the two-and-a-half years after transitioning to a new management structure, Enterprise Business sales grew from ¥1.8bn in FY3/18 and ¥3.3bn in FY3/19 to ¥5.0bn in FY3/20, delivering a 60+% average annual growth. The already substantial sales figure makes it more difficult to keep logging rapid growth, but if DHH were to, for instance, achieve even an average annual growth of 30% going forward, sales would reach ¥20.0bn in five years. Based on results in the past two years, this figure seems feasible. From FY3/21, revenues from LogiGear Group acquired in August 2019 will start contributing to full-year sales. The possibility of additional M&A deals aimed at strengthening competitiveness in the enterprise field may also emerge.

2) Checkpoints for realizing the roadmap

As explained in the market analysis section, considerable business opportunities exist in the software testing market of the enterprise field.

Medium-to long-term roadmap for the “Second Founding” period



Source: Company materials (Presentation Material for the Fiscal Year Ended March 31, 2020)

We believe the company will likely implement the following measures to capture demand for software testing and to accelerate operations toward further growth.

a) Secure human resources (quantitatively) to reduce opportunity loss

—Currently, one of the crucial issues for the company is how it secures human resources, because software testing is labor-intensive, and the number of test engineers directly impacts revenues. Some competitors are hiring human resources aggressively. DHH says it will actively utilize external resources, along with enhancing in-house resources as before to develop and utilize diverse human resources (see also the key measures for FY3/21 described later).

b) Transition to high-value-added human resources (improvement of quality)

—The revenue model of system testing services, as in debugging, is the function of unit price per time, number of personnel, and time. This means that revenue would increase, if high value-added human resources could charge a higher unit price per time. Out of the roughly 8,000 registered testers at DHH, many system test engineers and test design engineers are capable of earning a higher unit price per time due to having received internal or external education, and also many human resources hone their skills to become security consultants. Discovering such personnel and investing in them could not only help raise the unit price per time by offering higher skills, but it could also help boost the motivation of testers and thereby improve personnel retention. As such, it can be said that this is a highly effective investment.

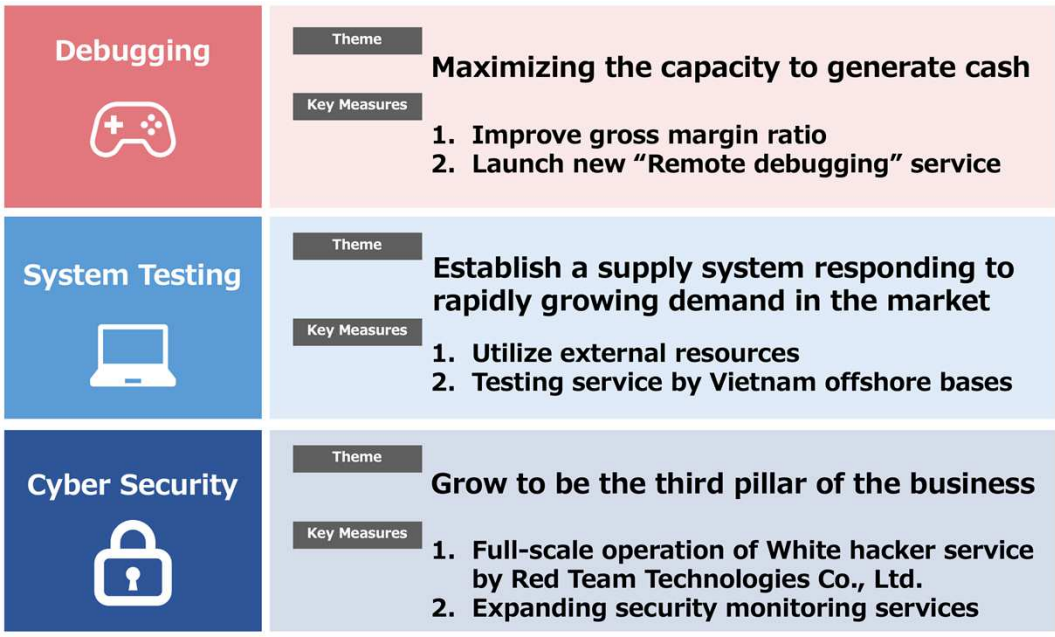
c) Improve productivity by utilizing AI and automation

—Rapid improvements in productivity cannot be expected if the business is dependent on human labor. There is also a need to bolster competitiveness and raise productivity exponentially by accumulating expertise in big data analysis and AI-related technologies.

2. Forecasts for FY3/21

The company left its earnings forecasts for FY3/21 undisclosed, citing the difficulty in developing a reasonable estimation due to the impact of COVID-19. Even in FY3/20, Entertainment Business sales had already been affected, due to delays in the development on the side of customers. Since the company's revenue model is primarily based on contracts per project, services that generate recurring revenues are limited. DHH says it has a fairly clear outlook on sales up to 1Q based on operations thus far. But, as the company explains, formulating a reasonable estimate will likely be difficult for the summer onward, unless the company has better visibility around the status of factors such as the containment of COVID-19, the response to a second wave, and corporate measures against socioeconomic conditions.

Summary of key measures for FY3/21



Source: Company materials (Presentation Material for the Fiscal Year Ended March 31, 2020)

3. Summary of key measures for FY3/21

The company has announced the following as a summary of its key measures for FY3/21.

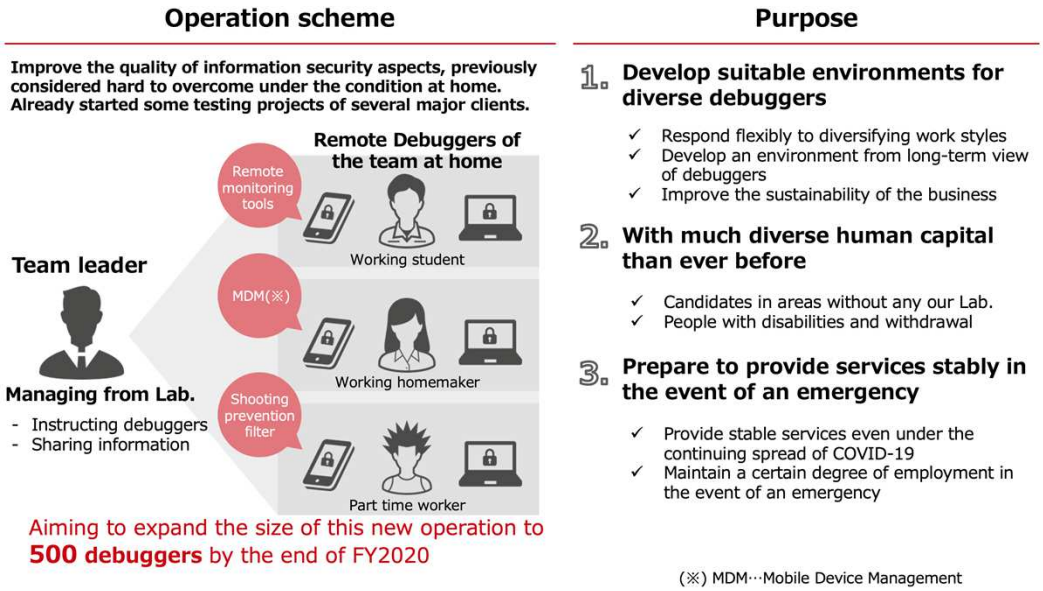
1) Debugging

As for debugging in the entertainment field, the company's core revenue driver, DHH aims to maximize its capacity to generate cash by a) improving the gross margin and b) launching a new remote debugging service.

—a) In improving the gross margin, the company expects to (i) expand high-unit-price services by raising the skills of testers, (ii) promote the optimization of Labs to turn them into profit centers from cost centers and raise the marginal profit ratio, and (iii) streamline back-office operations to reduce overhead costs.

—b) Regarding the launch of a remote debugging service, refer to the figure on the next page. By the end of February 2020, the company laid out its countermeasures against COVID-19, and the headquarters shifted roughly 80% of human resources to teleworking, centering on back-office members. Meanwhile, debugging from home posed difficulties from a security perspective. Still, DHH started remote debugging mainly for mobile games as part of its COVID-19 crisis response, and projects of several firms are already in operation. The company aims to have 500 at-home testers in service by the end of FY3/21.

Building a remote debugging operation scheme



Source: Company materials (Presentation Material for the Fiscal Year Ended March 31, 2020)

If remote debugging proves effective, not only can commutes be optimized, but various work styles can be accommodated, resulting in a better working environment. Remote debugging could also be a boon for one of DHH's major concerns—i.e., securing testers.

2) System testing

As mentioned above, the demand for system testing is expanding, and swiftly developing the supply system will be crucial in preventing opportunity losses. DHH looks to actively push for the utilization of external resources besides the ongoing use of internal resources (in-house engineers/Lab testers). Specifically, it expects to manage external engineers and establish contracts suitable for freelance engineers. It also looks to leverage its Vietnam offshore bases, aiming to draw on the test engineers enrolled at LogiGear Vietnam for Japanese customers.

3) Cyber security

Demand for cyber security will likely amplify further, reinforced by the advancement of networking stemming from progress in DX. Thus, DHH looks to focus on cyber security to turn it into a third pillar of the business alongside with debugging and system testing.

—a) Full-scale start of Red Team Technologies, Co., Ltd.: Red Team Technologies, established in November 2019, will go into full-scale operation to expand penetration tests provided by US cyber security firm Synack, Inc. Red Team Technologies already offers services to various industries and aims for further growth in sales.

—b) Expand security monitoring services and strengthen sales: In anticipation of work styles in the post-pandemic world, DHH aims to meet the growing need for network security fueled by the spread of teleworking and work from home. It plans to offer services that cater to diverse security needs through its in-house monitoring team, "DH-SOC."

4. Cautiously optimistic (?)

The spread of COVID-19 will likely continue to cloud the outlook for the economic environment, and the deterioration of not just the Japanese economy but also the global economy will have a large impact. Meanwhile, demand for services offered by the company will likely remain firm.

Microsoft Xbox Series X
(Scheduled for released during 2020 year-end sales campaign)

In the Entertainment Business, the release of Microsoft Xbox Series X and SONY PS5 slated for after the fall of this year, targeting the Christmas sales season, should serve as a positive factor. These new models are expected to come with various enhanced functions (e.g., GPU, memory, networks). Programming of gaming software will likely involve larger amounts of data to respond to high-performance specifications, further increasing the importance of debugging. Revenues related to these new models are only expected to contribute fully starting in FY3/22, but demand for DHH's debugging will likely remain robust.

SONY PlayStation 5
(Scheduled for released during 2020 year-end sales campaign)

As for system testing and security in the enterprise field, as already stated, the demand exceeds the supply, so further growth can be expected from factors like progress in remote debugging.

Based on the above, Sessa Partners believes excessive pessimism is unwarranted even when viewing the outlook for FY3/21 earnings cautiously.

DHH's share price has underperformed the market average and competitors since transitioning to a new structure, reflecting investor concerns over the ongoing decline in profits stemming from large investments in the enterprise field. Investments related to structural reforms will continue, but investment results anticipated by the management team are beginning to bear fruit since the middle of FY3/20. The timing in which these results emerge may be slightly delayed due to COVID-19's impact, but we expect the benefits to be reaped in the future.

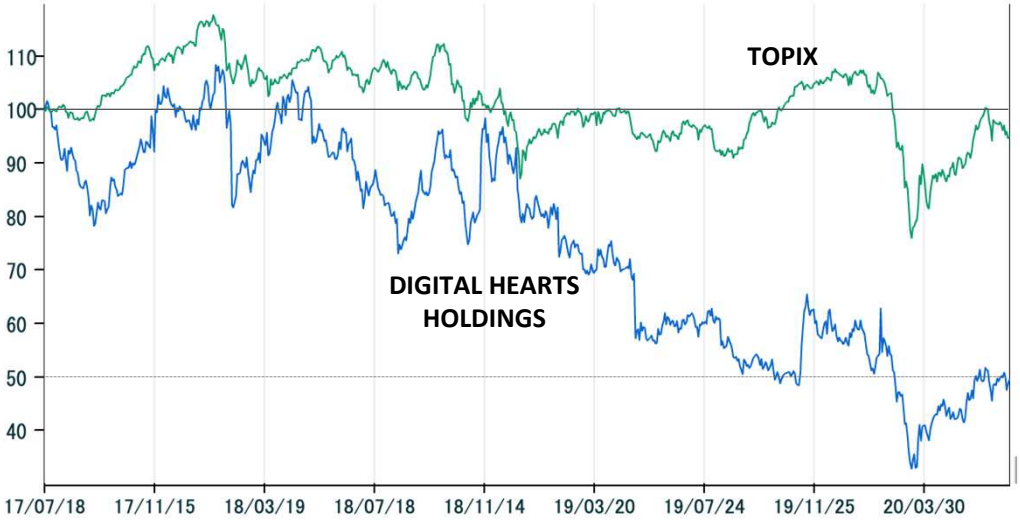
❼ Stock Information

1. **Share price trends**

Stock price chart

Source: Compiled by Sessa Partners from SPEEDA data

Chart vs. TOPIX index



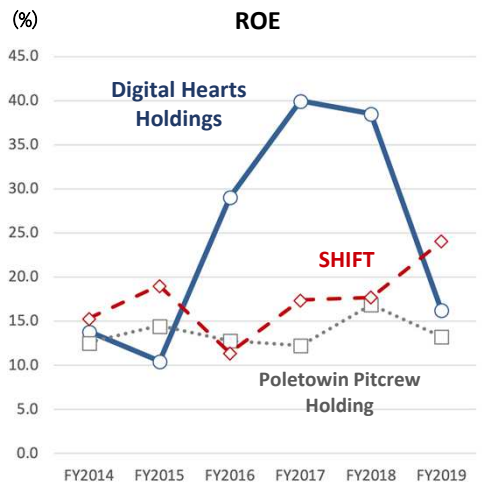
Source: Compiled by Sessa Partners from SPEEDA data

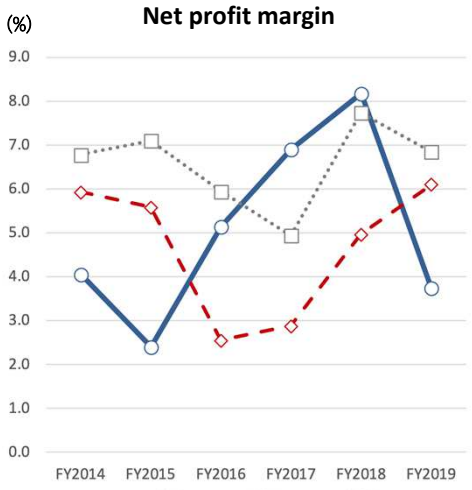
DHH's share price peaked in September 2016 before entering a downtrend and has since fallen shaprly versus the TOPIX index.

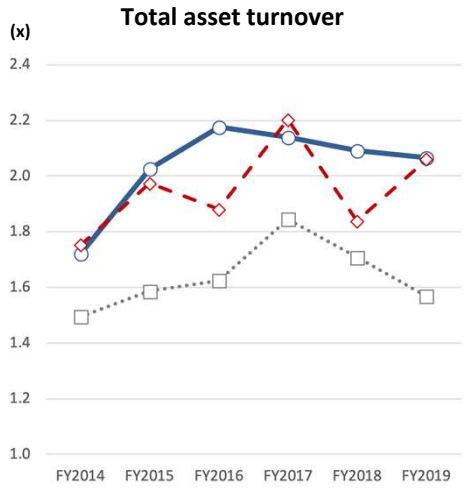
2. Consideration of financial indicators

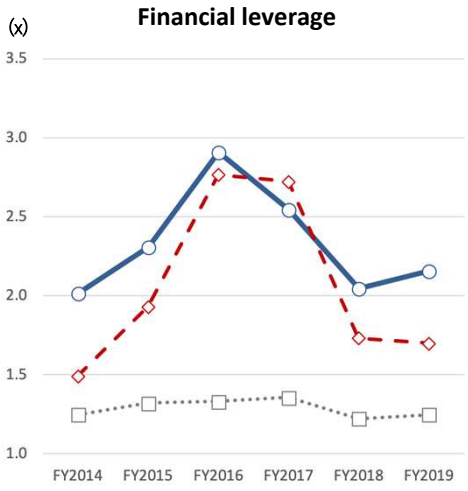
Now, we will look at the company's ROE. Comparing the financial data of three listed software testing companies, we can see that DHH's ROE is at a high level (excluded 4442:VALTES as there is limited data due to having been listed fairly recently; also, used TTM for 3697:SHIFT'S FY2019 data, as its financial period ends in August). Although the large decline in profit impacted ROE in FY3/20, until then, DHH's ROE had continued at a level above 30%. DHH has realized a high ROE based on its inherent ROE potential, arising from a high net profit margin and a relatively high asset turnover ratio, coupled with the effect of financial leverage.

ROE analysis





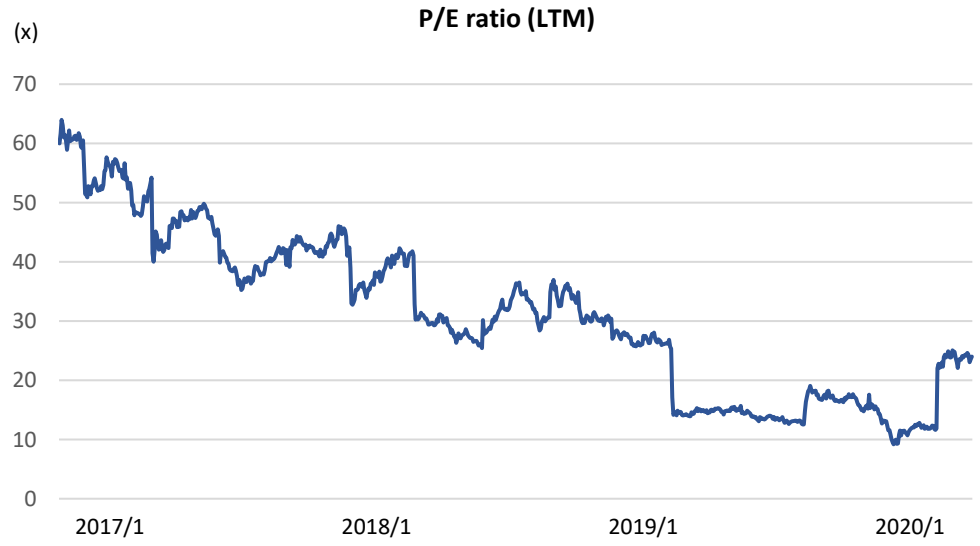




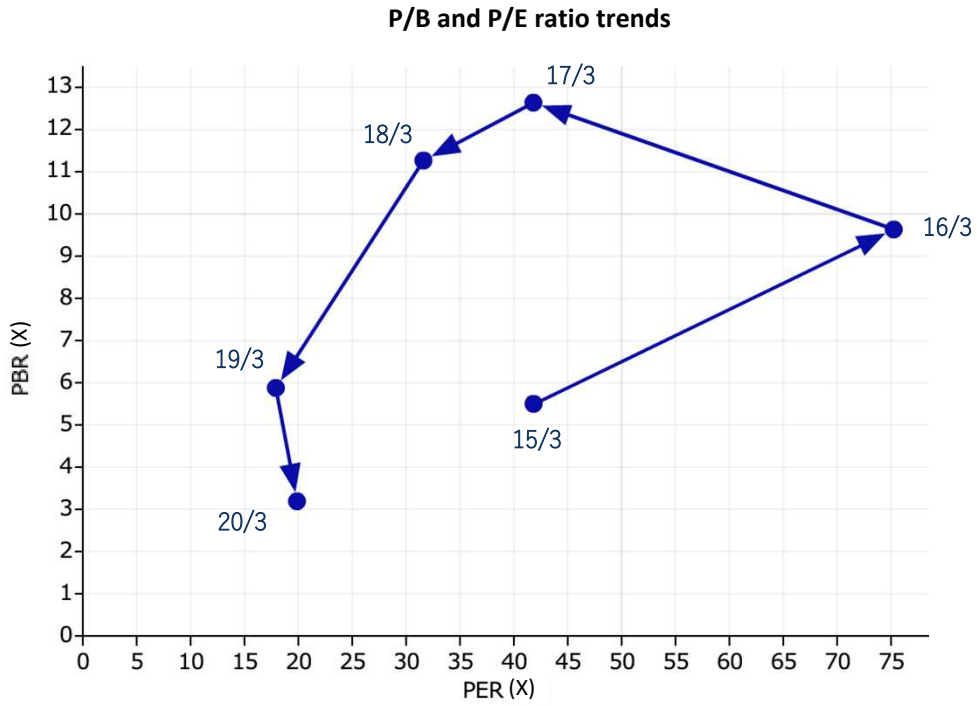
Source: Compiled by Sessa Partners from SPEEDA data

Meanwhile, when looking at the P/E and P/B ratios, the share price is at the bottom of its historical range.

Valuation (historical trend)



Source: Compiled by Sessa Partners from SPEEDA data



Source: Compiled by Sessa Partners from SPEEDA data

3. Stock price and financial data of four listed software testing firms

See the table on the next page for each data of the four listed software testing firms.

Stock price and financial data of four listed software testing firms

(Unit: JPY mn)

Code	3676	3657	3697	4442
Company Name	Digital Hearts Holdings	Poletowin Pitcrew Holdings	SHIFT	VALTES
Fiscal Year	2020/3	2020/1	2019/8	2020/3
Share Price（6/19）	**882**	**861**	**10,480**	**1,648**
Market Cap.	21,072	32,825	166,732	11,783
PER (X)	24.0	18.5	113.7	50.9
PBR (X)	3.85	2.35	17.65	9.14
Dividend Yield (%)	1.59	1.51	--	--
Year to date change	-12.1%	-11.7%	31.3%	-11.0%
YH	1,118(2/10)	1,113(6/5)	11,460(6/22)	2,265(1/20)
YL	552(3/23)	579(3/19)	5,610(3/17)	751(3/23)
10YH	2,200(16/9/29)	1,585.0(18/9/27)	11,460(20/6/22)	2,265(20/1/20)
10YL	552(20/3/23)	221.3(11/11/29)	640(16/2/12)	751(20/3/23)
Financial indicators				
ROE	16.3%	13.3%	17.7%	27.0%
ROA	7.7%	10.7%	9.1%	13.8%
ROIC	11.7%	18.6%	13.0%	23.3%
Equity ratio	46.3%	80.1%	57.7%	59.7%
Index per shares				
Shares out (thousand shares)	23,891	38,121	15,737	7,150
EPS (¥)	36.31	47.24	65.54	33.25
BPS (¥)	228.62	376.01	551.69	180.26
DPS (¥)	14.00	12.00	0.00	0.00
Financial data				
Net Sales	**21,138**	**26,120**	**19,532**	**4,876**
3Y CAGR	11.0%	10.0%	52.5%	28.6%
Gross Profit	**5,572**	**7,993**	**6,216**	**1,342**
Gross profit margin (%)	26.4%	30.6%	31.8%	27.5%
Operating Profit	**1,394**	**3,531**	**1,541**	**322**
3Y CAGR	-9.9%	13.6%	43.8%	51.8%
Operating profit margin (%)	6.6%	13.5%	7.9%	6.6%
Ordinary Profit	**1,372**	**3,474**	**1,545**	**323**
3Y CAGR	-11.8%	14.5%	39.4%	46.4%
Ordinary profit margin (%)	6.5%	13.3%	7.9%	6.6%
Net Profit attributable to owners of paent	**792**	**1,788**	**970**	**224**
3Y CAGR	-0.1%	15.2%	46.6%	80.6%
Net profit margin attributable to owners of parent (%)	3.7%	6.8%	5.0%	4.6%
No. of employees (fiscal year end)	**1,330**	**1,813**	**2,001**	**383**
3Y CAGR	27.1%	10.2%	60.6%	22.2%
Net sales per employee (thousand yen)	15,893	14,407	9,761	12,728
EBITDA	**1,733**	**4,140**	**1,867**	**351**
EBITDA margin	8.2%	15.8%	9.6%	7.2%
Cash Flows Statements				
Cash Flows from Operating Activities	1,087	2,402	1,134	246
Cash Flows from Investing Activities	-1,018	-850	-1,153	-81
Cash Flows from Financial Activities	-516	-416	6,248	539
Free Cash Flows	69	1,552	-19	165

Source: SPEEDA

4. Status of major shareholders

The table below shows the status of major shareholders (as of March 31, 2020). The founder, Eiichi Miyazawa, increased his shareholdings in 2020. His most recent holding ratio, including his asset management company A-1 LLC, rose to 37.68% (41.82% excluding treasury stock).

In addition, Genichi Tamatsuka, President & CEO since 2017, who has been leading the company during its "Second Founding" period, has been added to the list of major shareholders in the latest update.

Status of major shareholders

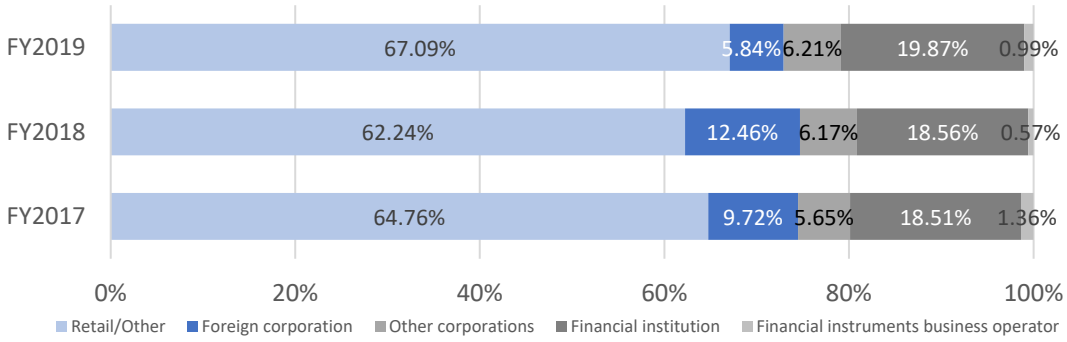
Rank	Shareholder	No. of shares	Holding ratio (%)
1	Eiichi Miyazawa	7,568,891	32.14
2	Japan Trustee Service Bank, Ltd. (Trust account)	3,273,500	13.70
3	Treasury shares	2,360,727	9.88
4	A-1 LLC	1,324,900	5.54
5	A&G Kyousou Toshi Daiichigo Toshi Jigyo Yugen Sekinin Kumiai	1,095,983	4.58
6	The Master Trust Bank of Japan, Ltd. (Trust account)	552,500	2.31
7	Japan Trustee Service Bank, Ltd. (Trust account 5)	209,100	0.87
8	Yasuyuki Wakasa	200,000	0.83
9	NOTHERN TRUST CO. (AVFC) RE IEDU UCITS CLIENTS NON LENDING 15 PCT TREATY ACCOUNT	193,700	0.81
10	STATE STREET CLIENT OMNIBUS ACCOUNT OM44	182,400	0.76
11	Genichi Tamatsuka	143,392	0.60
	Total	17,214,993	72.02

Source: Company materials

5. Status of shareholding by type of shareholder

The ratio of foreign shareholder has risen in recent years but declined in FY3/20 (FY2019).

Status of shareholding by type of shareholder

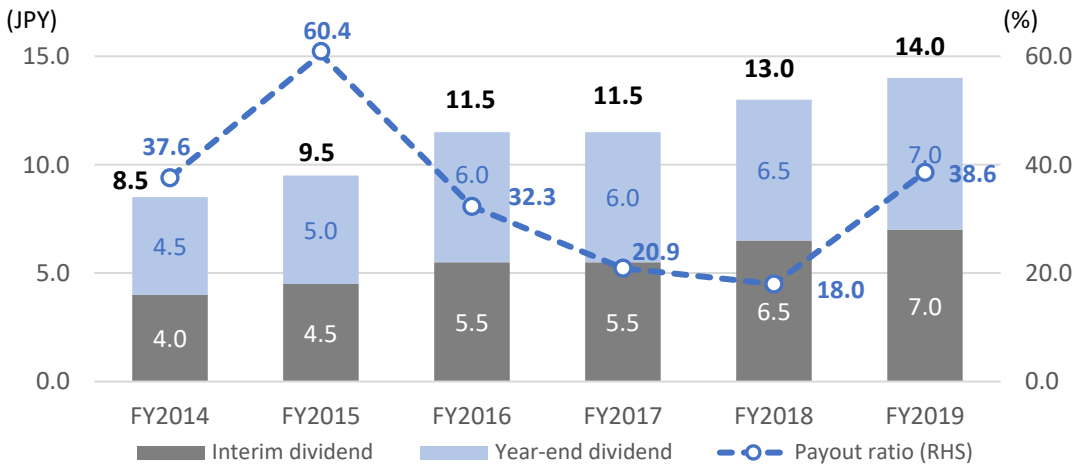


Source: Company materials

6. Dividends

The company has continued to raise dividends almost every year, and maintains a high dividend payout ratio. In addition, from November 2019 to February 2020, it bought back ¥499mn of its own shares, demonstrating a high level of managerial awareness toward shareholder returns.

Dividends



Source: Company materials

❽ Financial statements

Income statement

(Unit: JPY mn)

Fiscal Year	2015/3	2016/3	2017/3	2018/3	2019/3	2020/3
Total Revenue	**13,285**	**15,012**	**15,445**	**17,353**	**19,255**	**21,138**
Total Cost od Sales	9,337	10,691	10,939	12,394	13,791	15,566
Gross Profit	3,948	4,321	4,506	4,959	5,463	5,572
Gross profit margin	29.7%	28.8%	29.2%	28.6%	28.4%	26.4%
SG&A Expenses	2,431	2,357	2,600	3,223	3,858	4,178
Operating Profit	**1,517**	**1,964**	**1,907**	**1,736**	**1,606**	**1,394**
Operating profit margin	**11.4%**	**13.1%**	**12.3%**	**10.0%**	**8.3%**	**6.6%**
Non-Operating Income	67	44	128	58	109	23
Interest and Dividends Income	21	19	7	6	6	3
Non-Operating Expenses	58	49	38	11	64	44
Interest expenses	26	12	4	3	3	5
Income from Equity Method – non-operating	-27	0	-2	9	-4	-6
Ordinary Profit	**1,526**	**1,958**	**1,997**	**1,783**	**1,651**	**1,372**
Ordinary profit margin	**11.5%**	**13.0%**	**12.9%**	**10.3%**	**8.6%**	**6.5%**
Extraordinary Gains/Losses		-826	-556	-150	681	-76
Extraordinary Gain		10	18	2	733	
Extraordinary Loss		836	574	152	52	76
Pretax Profit	1,526	1,132	1,441	1,633	2,333	1,296
Pretax profit margin	11.5%	7.5%	9.3%	9.4%	12.1%	6.1%
Income Taxes	975	734	641	503	746	499
Income Taxes - current	734	689	668	562	756	548
Income Taxes - deferred	241	46	-26	-59	-11	-48
Net Profit attributable to owners of parent	**540**	**362**	**795**	**1,200**	**1,576**	**792**
Net Profit	551	398	800	1,130	1,588	797
Net Profit attributable to non-controlling shareholders	11	36	5	-71	12	5
Net profit margin attrib. to owners of parent	**4.1%**	**2.4%**	**5.1%**	**6.9%**	**8.2%**	**3.7%**
Other Comprehensive Income	28	-15	2	-17	-1	2
Net Gain on Revaluation of Available-for-sale Financial Asset (CI)	9	-9	1	-3	-2	0
Foreign Currency Translation Adjustment (CI)	19	-7	1	-14	2	2
Comprehensive Income	578	383	802	1,113	1,587	799
Comprehensive Income attributable to owners of parent	566	347	796	1,187	1,575	788
(Supplemental Data)						
EBIT	1,531	1,125	1,438	1,630	2,330	1,298
EBITDA	**1,955**	**2,325**	**2,138**	**2,010**	**1,860**	**1,733**
EBITDA margin	**14.7%**	**15.5%**	**13.8%**	**11.6%**	**9.7%**	**8.2%**
(Detail of Expenses)						
Total Payroll	992	1,009	1,102	1,248	1,457	
Payroll	992	1,009	1,102	1,248	1,457	
R&D Expenses			3	55	3	
Depreciation	276	197	119	197	136	175

Source: SPEEDA

Balance sheet

(Unit: JPY mn)

Fiscal Year	2015/3	2016/3	2017/3	2018/3	2019/3	2020/3
Total Assets	**8,273**	**6,534**	**7,652**	**8,575**	**9,832**	**10,637**
Current Assets	**5,757**	**5,065**	**6,221**	**6,814**	**7,404**	**7,453**
Cash, Cash Equivalents & ST Investments	3,059	2,198	3,345	3,894	4,198	3,904
Cash & Cash Equivalents	3,059	2,198	3,345	3,894	4,198	3,739
ST investments in Securities						165
Accounts Receivables	2,374	2,230	1,942	2,481	2,724	2,985
Inventories	12	25	8	15	21	43
Finished Goods and Merchandise		10	2	1	6	
Other Inventories	12	15	6	14	15	43
Deferred tax assets - current	116	87	75	81		
Allowance for doubtful accounts – cur.	-80	-50	-6	-14	-32	-40
Non-Current Assets	**2,516**	**1,469**	**1,430**	**1,762**	**2,429**	**3,184**
Property, Plant and Equipment (PPE)	368	299	298	474	558	579
Lands					18	18
Intangible Assets	1,506	580	239	287	763	1,379
Goodwill	1,170	438	201	150	481	1,028
Investments and other assets	642	590	894	1,001	1,107	1,225
Investment Securities (incl. subs/affil)	127	129	299	268	191	193
Investment Securities	127	129	299	268	191	193
Deferred tax assets – non-current	33	17	56	109	202	251
Allowance for doubtful accounts – n-cur.	0		-3	0	-12	-10
Total Liabilities	**4,104**	**3,444**	**4,793**	**5,005**	**4,820**	**5,199**
Current Liabilities	**3,824**	**3,374**	**3,759**	**3,929**	**4,192**	**5,135**
Accounts Payable – Other, Accrued Exp	1,178	1,144	1,051	1,561	1,387	1,411
Short-Term Debt	1,620	1,308	1,633	1,604	1,707	2,548
Short-Term Borrowings (incl. Lease Oblig)	1,440	1,232	1,600	1,600	1,705	2,548
Current Portion of Long-Term Debt	181	76	33	4	2	
Current Portion of LT Borrowings	181	76	33	4	2	
Non-Current Liabilities	**281**	**70**	**1,034**	**1,076**	**627**	**64**
Long-Term Debt	245	59	1,030	1,024	566	5
LT Borrowings (incl. Lease Oblig)	245	59	13	7	58	5
Convertible Bonds			1,017	1,017	509	
Deferred Tax Liabilities – non-current	4					
Provision for Retirement Benefits					36	43
Asset Retirement Obligations – non-current	3	2	2	17	14	14
Total Net Assets	**4,169**	**3,090**	**2,858**	**3,570**	**5,013**	**5,438**
Total Shareholders' Equity	**4,107**	**2,830**	**2,632**	**3,369**	**4,806**	**4,935**
Shareholders' Equity	4,037	2,774	2,591	3,341	4,764	4,898
Capital Stock	301	301	301	301	301	301
Capital Surplus	301	368	278	332	367	356
Retained Earnings	3,436	3,605	4,165	5,114	6,408	6,904
Treasury Stock	0	-1,500	-2,153	-2,405	-2,312	-2,663
Accum. Other Comprehensive Income	56	41	42	29	28	24
Val Diff. on Avail-for-Sales Securities	13	4	6	3	0	0
Foreign Currency Translation Adjust.	43	37	37	26	28	24
Share Warrants	15	15			13	13
Non-controlling interest	62	260	226	201	207	503

Source: SPEEDA

Supplementary data

(Unit: %, JPY mn, x)

Fiscal Year	2015/3	2016/3	2017/3	2018/3	2019/3	2020/3
Shareholders' Equity Ratio	49.64	43.31	34.40	39.29	48.88	46.39
ROE	13.80	10.44	29.11	39.99	38.56	16.26
ROA	7.00	4.89	11.21	14.79	17.12	7.74
ROIC	9.48	23.44	25.37	21.04	12.76	11.72
Interest-bearing Debt	1,866	1,368	2,664	2,628	2,273	2,553
D/E Ratio	0.45	0.48	1.01	0.78	0.47	0.52
Net D/E Ratio	-0.29	-0.29	-0.26	-0.38	-0.40	-0.24
Total Interest-Bearing Debt/EBITDA	0.95	0.59	1.25	1.31	1.22	1.47
Accumulated Depreciation	510	533	588	605	660	747
Investments in Affiliates and Loans	17	15	13	31	17	
Investments in Affiliates	17	15	13	31	17	
(Fair Value Information)						
Book Value – Securities not measured by the Mark-to- Market Method	17	15	176	219	159	

Source: SPEEDA

Cash flows statements

(Unit: JPY mn)

Fiscal Year	2015/3	2016/3	2017/3	2018/3	2019/3	2020/3
Cash Flows from Operating Activities	**870**	**1,080**	**1,825**	**1,436**	**890**	**1,087**
Depreciation and Amortization - CF	438	361	231	274	254	339
Depreciation - CF	276	197	119	197	136	175
Amortization of Goodwill - CF	162	164	112	77	118	164
Gain/Loss on Val. of Sec. & Invest. Sec.			30	97		
Gain/Loss on Sale of Sec. & Invest. Sec.					-733	
Gain/Loss on Sale of Investment Sec.					-733	
Gain/Loss on Sale of PPE		29	1	-1		
Interest and Dividends Received – Oper CF	1	1	1	1	0	1
Interest Paid – Oper CF	-26	-12	-4	-3	-3	-1
Cash Flows from Investing Activities	**-569**	**-17**	**-610**	**-619**	**62**	**-1,018**
Payments for Purchase of Securities and Investment Securities		-30	-212	-119	-56	-11
Payments for Purchase of Investment Sec.		-30	-212	-119	-56	-11
Proceeds from Sales of Securities and Investment Securities		30			842	0
Proceeds from Sales of Investment Sec.		30			842	0
Payments for Purchase of Affil Stock	-40					
Purchase/Sales of PPE	-104	-86	-94	-291	-84	-150
Payments for Purchase of PPE	-104	-86	-109	-293	-84	-150
Proceeds from Sales of PPE	0		15	2		
Purchase/Sales of Intangible Assets	-126	-94	-34	-69	-157	-107
Payments for Purchase of Intangible Ass.	-126	-94	-34	-69	-157	-107
Interest and Dividends received – Inv. CF	51	28	18	11	14	3
Cash Flows from Financial Activities	**-950**	**-1,913**	**-70**	**-251**	**-694**	**-516**
Proceeds from Short-Term Loans	1,788	1,880	1,700	1,000	1,205	1,800
Repayment of Short-Term Loans	-2,418	-2,088	-1,400	-1,000	-1,100	-1,000
Increase in Long-Term Debt	100	90	1,015			
Proceeds from Long-Term Loans	100	90				
Proceeds from Issuance of Bonds			1,015			
Repayments of Long-Term Debt	-204	-356	-13	-35	-516	-528
Repayments of Long-Term Loans	-204	-356	-13	-35		-4
Redemption of Bonds					-516	-524
Proceeds from Issuance of Stock	0					32
Redemption/Retirement of Stock		-1,515	-653	-6		-500
Cash Dividends Paid	-190	-211	-253	-273	-295	-317
Foreign exchange adjustment	14	-11	1	-2	0	-11
Changes in Cash Flow	-634	-861	1,147	550	268	-459
Cash & Cash Equivalent - Beginning	**3,693**	**3,059**	**2,198**	**3,345**	**3,894**	**4,163**
Cash & Cash Equivalent - Ending	**3,059**	**2,198**	**3,345**	**3,894**	**4,163**	**3,704**
Free Cash Flows	301	1,063	1,215	817	952	69

Source: SPEEDA

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