

INDUSTRIES

INFORMATION TECHNOLOGY

The term 'information technology' (IT) has ballooned to encompass many aspects of computing and technology. As one of the main drivers behind current technical innovation, IT is found through diverse applications in all industries. The IT-sector can be divided in four sub-sectors.



IT sectors



Business system integration

Installing IT applications to design infrastructural (hardware) and information (software) networks, including the management and administration of entire systems including PCs, servers, and datacenters.



Embedded technology

Customized, sophisticated software developed as applications to run electronics in non-computer devices such as cars, machinery, telephones, navigation systems, audio devices, electric razors, appliances, TVs and medical devices.



Hardware

All devices and equipment.



Gaming and mobile device applications

For simulation and entertainment.

Brabant is a highly innovative and high-tech region. Known as the 'brainport' of the Netherlands, it is perfectly suited for all functions related to the IT industry, including logistics, R&D, marketing and sales and headquarters functions.

Industry overview

In 2020, the IT sector in Brabant comprised 11,750 companies that employed 36,270 people, which was respectively 11.9% and 10.8% of the total in the Netherlands.



Brabant's added value lies in potential for collaborating with other industries, such as the HTSM sector.

In 2018, Brabant's IT sector's production value was

€ 7.4 billion

with an added value of **€ 3.4 billion.**

INFORMATION TECHNOLOGY: BRABANT COMPARED TO THE NETHERLANDS

	Establishments	Jobs
Brabant	11,750	36,270
Netherlands	98,420	336,470
Share Brabant	11.9%	10.8%

Source: Lisa 2020, CBS

11,750
companies

36,270
jobs

Brabant is strategically located in northwest Europe. It is an ideal location for servicing distributors, retailers and consumers in consumer IT/electronics. From HQ to distribution centers, customer care, repair and back office services, the Netherlands, is home to almost every major IT/Electronics company in the world, many of them with operations in Brabant.

Brabant hosts many IT suppliers and developers across industry sectors, including:

- Acer, IBM, Atos Origin, Ricoh, Canon, Sony, Samsung, TE Connectivity, Texas Instruments and MSI, all of whom have large operations in the region
- Leading multinational high tech companies such as ASML, NXP and Philips
- Subsidiaries of major global companies such as Wipro, Infosys, Tata Consultancy Services, Getronics and Atos Origin, with major IT development or support centers in the region

The Design Academy, the Eindhoven University of Technology (TU/e) and internationally renowned institutes such as Holst Centre and Embedded Systems Innovation provide an environment in which technology meets customer demands and where new technology, ideas and products are constantly being created.

PROMINENT EMBEDDED SYSTEMS COMPANIES IN BRABANT

Company	City	Product	Country
Altran	Eindhoven	Embedded software design	France
Anteryon	Eindhoven	Optical products	Netherlands
ASML	Veldhoven	Wafer steppers	Netherlands
Cavendish Kinetics	Den Bosch	IP company	USA
Dynniq Nederland	Eindhoven	Engineering & IT	Netherlands
GEA Food Solutions	Bakel	Machines for food industry	Germany
ICT Netherlands	Eindhoven / Bergen op Zoom	Embedded systems (software)	Netherlands
Itom	Eindhoven	R&D on chip design	Netherlands
MEVI Group	Helmond	Precision parts, high-tech engineering	Netherlands
NTT DATA Business Solutions	Den Bosch	SAP solutions	Japan
NXP Semiconductors	Eindhoven	Semiconductors	Netherlands
Philips Research Eindhoven	Eindhoven	Contract R&D	Netherlands
Ricoh	Den Bosch	IT services and printing	Japan
Siemens Industry Software	Eindhoven	Industrial Software	Germany
Sioux Embedded Systems	Eindhoven	Embedded systems (software)	Netherlands
Synopsys	Eindhoven	IP Software	USA
Teledyne Dalsa	Eindhoven	Specialized semiconductors	Canada
Thermo Fisher Scientific	Eindhoven	Control devices for processing equipment	USA
Zylom Media Groep	Eindhoven	Gaming	Netherlands

Source: BOM

PROMINENT BUSINESS INTEGRATION COMPANIES IN BRABANT

Company	City	Product	Country
ATOS	Eindhoven	IT services	France
Blueriq	Den Bosch	IT Services	Netherlands
Centric	Den Bosch/Son	IT services	Netherlands
CGI	Eindhoven	IT consultancy	Canada
CTAC SAP Services	Den Bosch	SAP services	Netherlands
Dassault Systemes	Den Bosch	IT Services	France
Ordina	Eindhoven	Software house	Netherlands
PinkRocade	Den Bosch	IT Services	Netherlands
Ricoh B.V.	Den Bosch	IT services and printing	Japan
RoyalHaskoningDHV	Eindhoven	Engineering services	Netherlands
SAP	Den Bosch	Software House	Germany
Stork Technical Services	Veghel	Consultancy in maintenance	Netherlands
Synopsys	Eindhoven	IP software	USA
Thermo Fisher	Eindhoven	Control devices for processing eq.	USA
Wipro	Eindhoven	IT services	India

Source: BOM, Fanion onderzoek & advies

PROMINENT HARDWARE COMPANIES IN BRABANT

Company	City	Product	Country
Acer Computer	Den Bosch	Notebooks	Taiwan
Advantech Europe	Eindhoven	Motherboards, embedded comp.	Taiwan
ASML	Veldhoven	Wafer steppers	Netherlands
BenQ Europe	Eindhoven	Electronics and IT	Taiwan
Dialog Semiconductor	Den Bosch	Chip design	Netherlands
HERE Technologies	Eindhoven	Digital map data	Netherlands
Intel	Eindhoven	Semiconductors	USA
MSI Computer	Eindhoven	Notebooks	Taiwan
Neways Electronics	Eindhoven	Electronic components	Netherlands
NXP Semiconductors	Eindhoven	Semiconductors	Netherlands
Omron	Den Bosch	Electronic components	Japan
Philips Electronics	Eindhoven	Medical equipment	Netherlands
Ricoh	Den Bosch	IT services and printing	Japan
Samsung Electronics	Tilburg	Consumer electronics	Korea
Sony	Tilburg	Consumer electronics	Japan
ST Micro Electronics	Eindhoven	Semiconductors	Switzerland
TE Connectivity	Den Bosch	Electronics components	Switzerland
Thermo Fisher Scientific	Eindhoven	Control devices for processing eq.	USA

Source: BOM

Regional strengths

Brabant's leading position in the IT industry is demonstrated by the presence of key industry players. Brabant is a highly innovative and high-tech region. Known as the 'brainport' of the Netherlands it is perfectly suited to the IT industry's logistics, R&D, marketing and sales and headquarters functions.

With a strategic geographical position and outstanding transport infrastructure, Brabant is an ideal logistics location for service providers, developers, distributors, retailers, consumers and specialized service providers of value-added-services (VAS) including:



Technical automation (embedded and in-product software)



Business IT (application development, integration and infrastructure)



IT hardware development (devices, subassemblies and computer assembly)

Brabant ranks as one of the top regions on the European Union Innovation Scoreboard. IT companies with marketing and sales and headquarters facilities here benefit from:



A favorable tax system



Outstanding business environment



One of the world's highest national broadband penetration levels

Talent IT

IT is an important and growing sector in the Brabant economy. Brabant holds a strong position in IT in the Netherlands, as the region accounts for no less than 11.9% of all IT-companies and 10.6% of IT-jobs in the country. Moreover, the sector has grown strongly in the last five years. The number of IT-companies increased with 18.4% from 9,920 in 2016 to 11,750 in 2020. The number of jobs increased with 13.5%: from 31,970 jobs in 2016 to 36,270 jobs in 2017.



Workforce: employment in ICT by education level



Students: number of graduates



Unemployment

INFORMATION & COMMUNICATION, BRABANT

Year	2016	2020
Establishments total	9,920	11,750
Jobs total	31,970	36,270

Source: Lisa 2020

Workforce: employment

Brabant counts about 36,210 people working in the Information & Communication Technology industry. Over 64% has a higher education (UAS / University (BSc/MSc)), 30% has a medium education (HAVO/VWO/MBO) and only 6% has lower education (primary school/VMBO). This last group provides services at the installation of hardware or other supporting services.

This means that in Brabant 23,380 highly educated people are active in the ICT-sector.

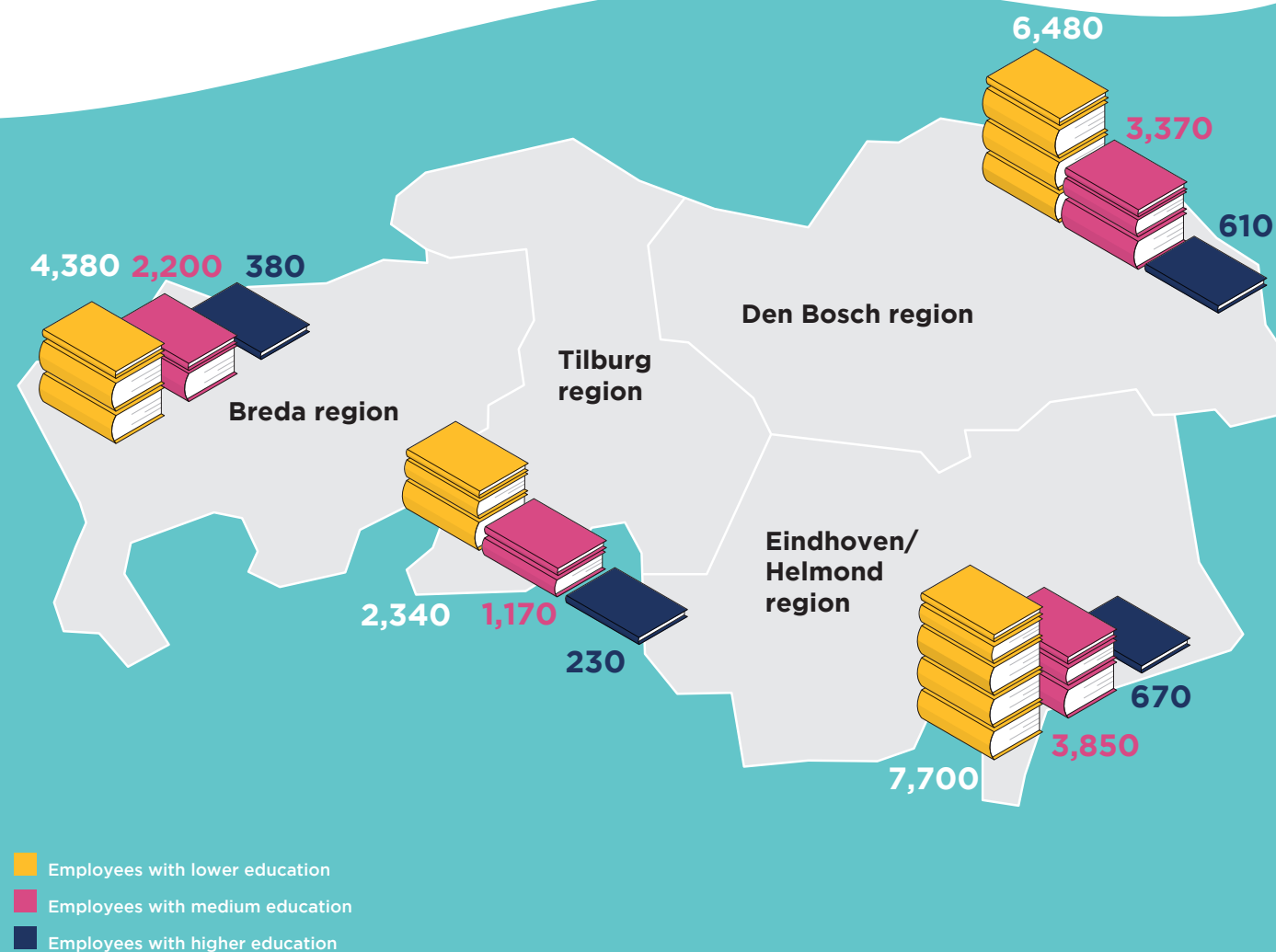
EMPLOYEES IN ICT BY EDUCATION LEVEL AND REGION, 2020

	Total	Low	Medium	High
Breda region	7,410	420	2,200	4,790
Tilburg region	4,170	240	1,240	2,690
Den Bosch region	11,120	650	3,350	7,120
Eindhoven / Helmond region	13,490	730	3,980	8,770
Brabant	36,210	2,040	10,780	23,380

	Total	Low	Medium	High
Breda region	100%	5.7%	29.7%	64.6%
Tilburg region	100%	5.8%	29.8%	64.5%
Den Bosch region	100%	5.8%	30.1%	64.0%
Eindhoven / Helmond region	100%	5.4%	29.5%	65.0%
Brabant	100%	5.6%	29.8%	64.6%

Source: CBS, Vestigingenregister Noord-Brabant, 2020, edited by Fanion onderzoek & advies

NUMBER OF EMPLOYEES IN ICT BY EDUCATION LEVEL



Number of employees	Total	Low	Medium	High
Breda region	6,990	410	2,200	4,380
Tilburg region	3,730	230	1,170	2,340
Den Bosch region	10,460	610	3,370	6,480
Eindhoven/Helmond region	12,220	670	3,850	7,700
Brabant	33,410	1,920	10,590	20,900

Share (percentage)	Total	Low	Medium	High
Breda region	100.0%	5.9%	31.5%	62.6%
Tilburg region	100.0%	6.1%	31.4%	62.6%
Den Bosch region	100.0%	5.9%	32.3%	61.9%
Eindhoven/Helmond region	100.0%	5.5%	31.5%	63.0%
Brabant	100.0%	5.8%	31.7%	62.5%

Source: CBS, Vestigingenregister Noord-Brabant, 2018, edited by Fanion onderzoek & advies

Graduates in ICT

Graduates form the largest group of new people entering the labor market.

Eindhoven University of Technology (TU/e) and Tilburg University offer several programs that are related to ICT. At a bachelor level most students graduate from technical computing, followed by technical mathematics and data science. The Data Science program started in 2016. At the master level Eindhoven University of Technology offers five different ICT-related programs, with about 600 students annually. Tilburg University offers both Bachelor and Master programs in ICT. Over 2,010 students follow a bachelor program and over 1,250 follow a Master program.

In 2019 almost 240 bachelor students and 260 master students graduated from one of the ICT-related program at Eindhoven University of Technology, a number that continues to grow.

At Tilburg University, 160 bachelors and 640 Masters graduated from a study program that meets the IT requirements.

Source: DUO

TOTAL ENROLLED STUDENTS IN BACHELOR AND MASTER PROGRAMS RELATED TO ICT, 2016-2020

Eindhoven University of Technology	2016	2017	2018	2019	2020
Bachelor	1,100	1,240	1,300	1,310	1,460
Data Science (joint degree)	60	80	140	190	260
Technical Computing	750	830	810	780	860
Technical Mathematics	300	330	340	340	340
Master	600	700	860	1,030	1,140
Computer Science and Engineering	230	290	370	500	620
Embedded Systems	160	170	180	170	170
Industrial and Applied Mathematics	120	110	120	140	180
Business Information Systems	80	80	50	30	10
Data Science and Entrepreneurship (joint degree)	20	50	140	190	170
Tilburg University	2016	2017	2018	2019	2020
Bachelor	690	930	1,130	1,420	2,010
Data Science (joint degree)	-	50	70	130	140
Cognitive Science and Artificial Intelligence	-	-	-	250	380
Economics and Informatics	-	-	-	-	-
Communication and Information Sciences	350	470	590	560	660
Econometrics and Operational Research	340	410	470	490	540
Entrepreneurship and Business Innovation	-	-	-	-	290
Master	590	680	860	1,000	1,250
Communication & Information Sciences	380	410	560	480	450
Communication & Information Sciences (research)	10	10	10	-	-
Data Science and Society	-	-	-	280	490
Business Analytics and Operations Research	70	90	100	90	110
Cognitive Science and Artificial Intelligence	-	-	-	-	10
Information Management	140	170	190	160	190

TOTAL GRADUATED STUDENTS 2015-2019

EINDHOVEN UNIVERSITY OF TECHNOLOGY AND TILBURG UNIVERSITY

Eindhoven University of Technology	2015	2016	2017	2018	2019
Bachelor	100	120	150	240	240
Data Science (joint degree)	0	0	0	10	20
Technical Computing	60	100	110	180	170
Technical Mathematics	40	20	40	60	50
Master	170	160	200	240	260
Computer Science and Engineering	70	50	80	110	110
Data Science and Entrepreneurship (joint degree)	0	0	0	10	50
Embedded Systems	50	50	60	80	50
Industrial and Applied Mathematics	30	30	40	30	30
Business Information Systems	30	30	30	20	20
Tilburg University	2015	2016	2017	2018	2019
Bachelor	120	110	140	110	160
Data Science (joint degree)	0	0	0	10	10
Cognitive Science and Artificial Intelligence	0	0	0	0	10
Economics and Informatics	10	0	0	0	0
Communication and Information Sciences	70	60	70	50	50
Econometrics and Operational Research	40	50	70	50	80
Master	290	350	390	570	640
Communication & Information Sciences	190	230	230	320	310
Communication & Information Sciences (research)	0	10	0	0	0
Data Science and Society	0	0	0	50	140
Business Analytics and Operations Research	20	30	40	40	40
Data Science and Entrepreneurship (joint degree)	0	0	10	20	30
Information Management	80	90	110	140	120

Source: DUO, 2021

NHTV Breda UAS, Avans UAS and Fontys UAS offer specific programs for the ICT sector. The total number of graduates has grown with 33% over the period 2015-2019. In 2019, 1,200 students graduated in ICT courses at the university colleges in Brabant.

Graduates at medium education level

At the vocational level about 910 students graduated in 2019 from an ICT related study. These studies train their students to become for instance Employee ICT, ICT staff, Assistant ICT, Application developer, game artist, media technology, etc. The Eindhoven region accounts for the largest number of graduates (340), followed by the Den Bosch region (270).

Graduates at secondary education level (HAVO & VWO)

Furthermore, there are 6,180 students at the secondary educational level with a program that suits the demands of the ICT sector. These students have a technical profile with mathematics in their curriculum and mostly continue their education at a higher level at a UAS or University.

* programs ICT

Source: DUO, edited by Fanion onderzoek & advies

NUMBER OF GRADUATES ICT-PROGRAMS, UNIVERSITIES OF APPLIED SCIENCES

University of Applied Science	2015	2016	2017	2018	2019
Avans UAS	380	410	390	420	470
Ad Computer Science	0	0	0	10	30
Computer science	110	140	120	130	200
Technical informatics	30	30	50	30	40
Business IT & Management	60	50	60	80	60
Communication and Multimedia Design	190	180	170	160	140
Breda UAS	130	190	180	160	170
Creative Media and Game Technologies	120	180	170	160	160
Game Technology	10	10	10	10	10
Fontys UAS	380	380	440	470	560
HBO-ICT	350	330	390	430	500
Applied Mathematics	10	20	20	20	30
ICT Service Management	20	30	30	20	20
Total	900	970	1,010	1,050	1,190

GRADUATES MEDIUM AND SECONDARY EDUCATION LEVEL WITH A PROFILE THAT MATCHES WITH ICT* IN 2018/2019

	MBO	HAVO	VWO	TOTAL
Breda region	210	640	680	1,530
Tilburg region	100	570	500	1,170
Den Bosch region	270	870	920	2,050
Eindhoven / Helmond region	340	990	1,010	2,340
Brabant	910	3,070	3,110	7,090

Jobseekers without a job in ICT

In 2020 there were on average 1,430 ICT-specialists unemployed, of which 40% has a medium education and 30% has a higher education. Most unemployed in the ICT-sector are to be found in the Eindhoven / Helmond region.

JOBSEEKERS WITHOUT A CONTRACT IN ICT, AVERAGE OVER 2020

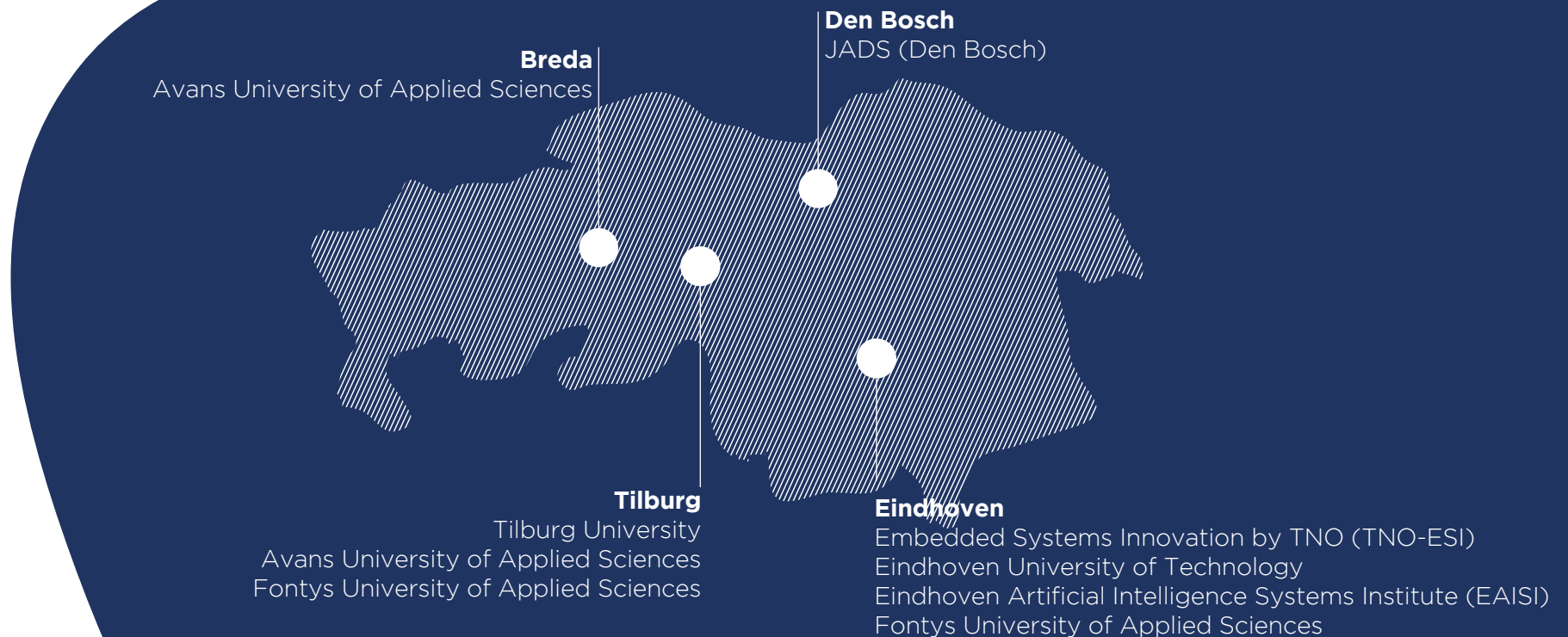
ICT professions	Low	Medium	High	Total
Tilburg region	100	110	90	300
Den Bosch region	70	120	90	280
Breda region	90	150	90	330
Eindhoven / Helmond region	90	150	90	330
Total	390	580	460	1,430

Source: UWV, www.werk.nl (2021)

Knowledge institutes and networks

Brabant is well known for its innovative spirit. High quality education and research institutes play a key role in the IT R&D conducted in the region. The thriving R&D environment is supported by:

- Strong educational infrastructure, including two universities and a large number of higher vocational education institutes with a technical focus
- High degree of cooperation between technical universities, institutes and companies
- Many research institutes active in high-end technological research
- Companies and knowledge institutes performing world-class R&D in embedded systems services
- Companies and knowledge institutes specialized in optimizing IT services, and multiple institutes linked to High Tech Systems in neighboring areas in Belgium, Germany and the Netherlands



KNOWLEDGE INSTITUTES AND NETWORKS

EINDHOVEN UNIVERSITY OF TECHNOLOGY

The TU/e offers several masters programs in the field of IT: Business Information Systems, Computer Science & Engineering and Embedded Systems, and Information Security Technology. The Eindhoven Institute for Research on ICT (EIRICT), affiliated with the TU/e, conducts high-tech ICT research and is a contact point for (local) governments, public organizations, companies and research consortia.

www.tue.nl



EINDHOVEN ARTIFICIAL INTELLIGENCE SYSTEMS INSTITUTE (EAI SI)

The Eindhoven AI Systems Institute brings together all TU/e artificial intelligence activities. Top researchers from the various research groups work together to create new and exciting AI methodologies and applications with a direct impact on the real world. Through the establishment of EAI SI (pronounced "Easy"), the Eindhoven University of Technology aims to contribute to the growing importance of AI in society, business, and science, and to meet the rapidly increasing demand for education, engineers, and expertise in the field of AI.

www.tue.nl



AVANS UNIVERSITIES OF APPLIED SCIENCES

The Avans University of Applied Sciences provides education and hosts research in ten different fields and across 13 locations in Breda, Den Bosch, Tilburg, and Roosendaal. Avans has six centers of expertise and more than 25 research groups. These groups of researchers conduct practical research.

IT-related courses at the Avans University of Applied Sciences:

- Associate Degree in Informatics
- Business IT & Management
- Communication and Multimedia Design
- Informatics
- Technical Informatics
- Master Animatio

www.avans.nl



FONTYS UNIVERSITIES OF APPLIED SCIENCES

Fontys is the largest university of applied sciences in the southern Netherlands. Its mission is to provide inspiring, challenging, and outstanding higher vocational education and to conduct practical research that is truly meaningful to society. Education and research at Fontys are directly in line with the current and future demands and needs of students, the professional arena, and (regional) society.

IT-related courses at the Fontys University of Applied Sciences:

- Bachelor of Automotive Engineering
- Bachelor of IT
- Bachelor of Information Technology – Software
- Engineering and Business Informatics
- Bachelor of Mechatronics
- Bachelor of Applied mathematics
- Associate degree in IT

www.fontys.nl



KNOWLEDGE INSTITUTES AND NETWORKS

EMBEDDED SYSTEMS INNOVATION BY TNO

Originally founded in 2002 by industry-leading companies ASML, Océ, Philips and TNO, along with Delft University of Technology, Eindhoven University of Technology and the University of Twente, the former Embedded Systems Institute (ESI) was integrated into TNO as 'Embedded Systems Innovation by TNO' (TNO-ESI), in January 2013. The TNO-ESI program represents the special interests of the national high-tech OEM and SME industries, and addresses current and future needs in fields such as mobility, health, and safety and security. Through an open innovation structure, TNO-ESI collaborates with a wide range of industrial and academic partners, helping them stay ahead of the innovation curve and lead innovations in embedded systems technology.

www.esi.nl



JHERONIMUS ACADEMY OF DATA SCIENCE (JADS)

The Jheronimus Academy of Data Science (JADS) is a unique concept in the Netherlands, which allows graduates to study, research and apply data science at three different Data Science Centers (TU Eindhoven, Tilburg University, and Mariënborg Campus, Den Bosch) as part of the PDEng program and to incorporate what they learn into existing ecosystems. The mission of JADS is to understand and further the value of data for solving complex societal and business challenges, with the academy serving as a linchpin between industry and the applied data science research conducted throughout JADS.

The Data Science and Entrepreneurship Graduate School turns out entrepreneurial and innovative data scientists who are just as good at performing cutting-edge scientific research as they are at applying it to the most pressing societal and business challenges. These graduates learn to operate in a collaborative ecosystem, fostering a stream of new scalable (or exponential) business models in Brabant and beyond.

www.jads.nl



TILBURG UNIVERSITY

Tilburg University is made up of five schools: the Tilburg School of Economics & Management, Tilburg Law School, Tilburg School of Social and Behavioral Sciences, Tilburg School of Humanities and Digital Sciences (University College Tilburg), and Tilburg School of Catholic Theology.

AI plays a role in providing better and more efficient responses to major issues. Tilburg University's strength is that it illuminates these issues from various angles. The university combines expertise in AI with expertise in people and society.

Tilburg University is home to 38 research groups and institutes. Those with a focus on IT are the Data Science Center Tilburg (DSC/t), the Institute for Data Collection and Research (CentERdata) and the Tilburg University Artificial Intelligence Special Interest Group (TAISIG), the Tilburg Center for Cognition and Communication, and the Tilburg Institute for Law, Technology, and Society (TILT)

www.tilburguniversity.edu

