ISBSG
Delivering IT Confidence

The global and independent source of data and analysis for the IT industry

Corporate Release 2024 R1

Demographics

Development & Enhancement Repository

Published by the International Software Benchmarking Standards Group

09-2024

Table of Contents

Introduction

This document provides details of the various project data types that are included in the ISBSG D&E (Development & Enhancement) repository September 2024.

You will note that the project totals shown at the bottom of the tables rarely equal the 12,521 projects in the Repository. This is because submitters do not necessarily provide project data for all the data fields that ISBSG offers. The "ISBSG Field Descriptions" document explains the contents of the various data fields that the Repository caters for.

By studying the demographics that follow, you will be able to establish the areas that are of specific interest to you. The data in the Repository projects have come from over thirty countries. This is what makes the ISBSG Repository unique. A broad range of project types from many industries and many business areas are available for you to use for estimating, awareness of trends, comparison of platforms and languages or benchmarking.

Executive summary

The projects in the Repository cover a broad cross-section of the software industry. In general, they have a business focus.

Project origin

- The projects have been submitted from more than 26 different countries. Major contributors are Netherlands (22.6%), Spain (22.5% of all projects), United States (17.2%), Australia (6.8%), Japan (6.8%), Finland (4.8%), China (4.0%), France (3.8%), Canada (2.9%), India (2.6%), Denmark (1.4%), Brazil (1.4%), Mexico (1.2%) and United Kingdom (0.7%).
- The projects were performed in more than 30 different countries. Major contributors are Spain (27.3% of all projects where the country of effort is known), Netherlands (21.7%), United States (9.1%), Finland (6.8%), France (5.3%), India (4.9%), Australia (4.6%), China (4.6%), Japan (3.1%) and Canada (2.9%).

Project context

- Industry sector: major sectors are Communications (28.9% of all projects where the organization type is known), Insurance (13.1%), Government (10.0%), Manufacturing (9.9%), Banking (8.1%), Medical and health care (4.7%), Financial (4.0%) Wholesale/Retail (2.4%), Electronics/computers (1.7%) and Service industry (1.7%).
- Business area: major areas are Communications (36.9% of all projects where the business area is known), Insurance (16.0%), Banking (9.5%), Manufacturing (7.7%), Government (7.2%), Medical & Health Care (5.7%), Finance (4.5%), Public Sector (2.7%), Computers & Software (1.7%) and Community Services (1.3%).

Type of project

- Development type: 74.7% are enhancement projects, 24.0% are new developments, and 0.8% are re-developments.

- Intended market: 94.0% of projects are developed for internal use, (i.e. for the organization that contributed the project to the Repository), and 5.8% for external use. 25.6% are developed in-house and 74.2% are outsourced.
- Team size: 37.6% of projects have up to 4 people in the development team, 30.2% have 5 to 9 people, 18.5% have 10 to 19 people, and 13.6% have 20 or more people.

Type of product

- Application group: 93.3% are business applications, 3.5% are real-time applications, and 2.5% are mathematically-intensive applications.
- Architecture: 35.9% of projects for which this information is available have a client-server architecture, and 28.0% have a multi-tier architecture (there is some overlap between these groups of projects). 36.1% are stand-alone systems.

Development environment

- Platform: 30.4% are mainframe projects, 10.3% midrange, and 27.3% personal computers. 32.0% of projects involve multiple platforms.

Development methods

- For ISBSG purposes a methodology applies to the whole project development process. This is distinct from techniques, which apply to individual activities within the development process.
- Methodology: 60.8% of projects that describe methodologies report using a waterfall model. Other methodologies include Agile and/or RUP (30.9%), Joint Application Development (2.0%), Rapid Application Development (2.0%), Multi-functional teams (1.8%) and Timeboxing (0.4%).

Demographics

Project origin

Country of origin

Projects have been contributed from 26 different countries.

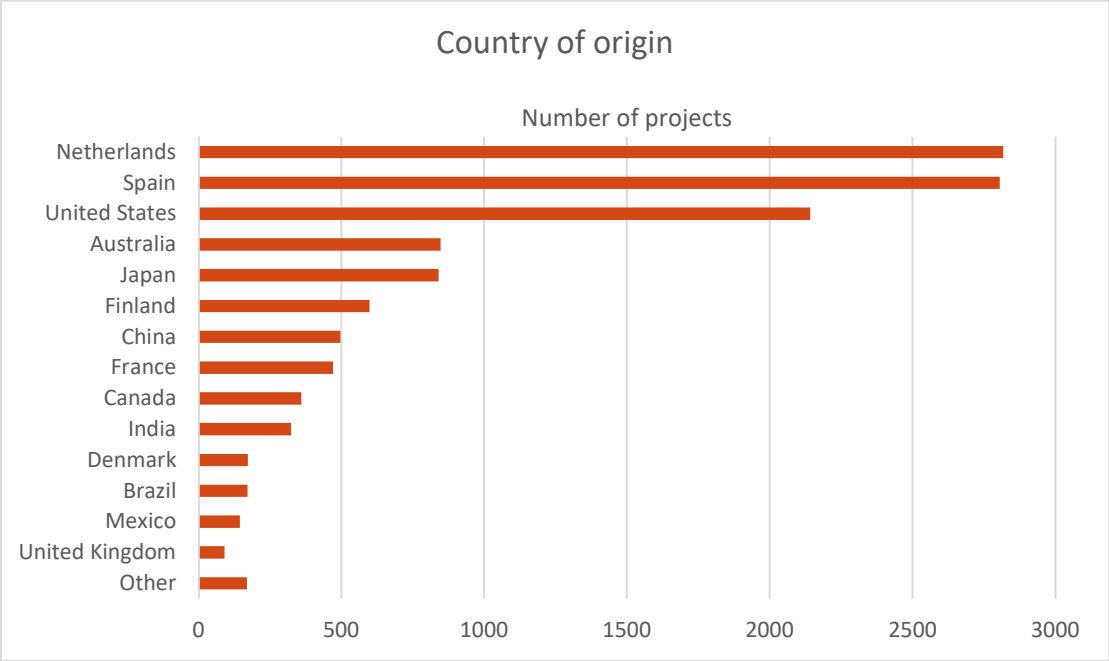

Figure 1 - Demographics country of origin

Demographics		
Country of origin	**Projects**	**Percentage**
Countries	**N**	**%**
Netherlands	2818	22.6%
Spain	2805	22.5%
United States	2142	17.2%
Australia	847	6.8%
Japan	841	6.8%
Finland	599	4.8%
China	497	4.0%
France	471	3.8%
Canada	360	2.9%
India	324	2.6%
Denmark	172	1.4%
Brazil	171	1.4%
Mexico	145	1.2%
United Kingdom	91	0.7%
Other	169	1.4%
Total	12452	100%

Table 1 - Demographics country of origin

Country of effort

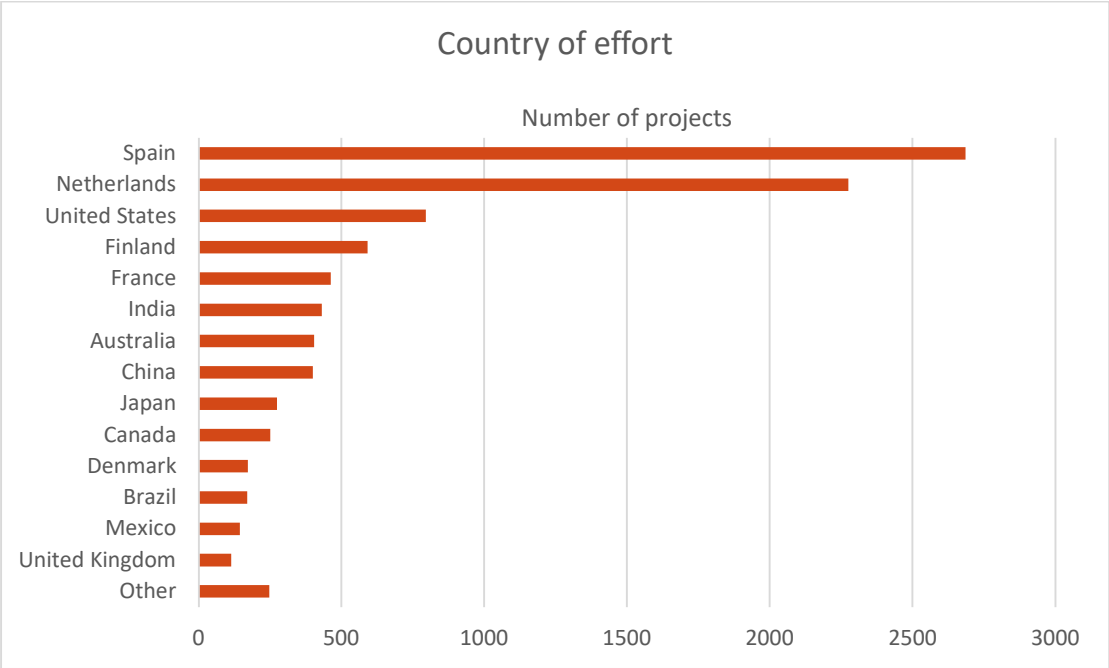

Figure 2 - Demographics country of effort

Demographics		
Country of effort	**Projects**	**Percentage**
Countries	**N**	**%**
Spain	2686	28.5%
Netherlands	2275	24.1%
United States	796	8.4%
Finland	592	6.3%
France	463	4.9%
India	432	4.6%
Australia	405	4.3%
China	400	4.2%
Japan	275	2.9%
Canada	251	2.7%
Denmark	173	1.8%
Brazil	170	1.8%
Mexico	145	1.5%
United Kingdom	114	1.2%
Other	248	2.6%
Total	9425	100%

Table 2 - Demographics country of effort

Project context

Industry sector

The Industry Sector summarizes the industry, or type of organization, for which each project has been developed.

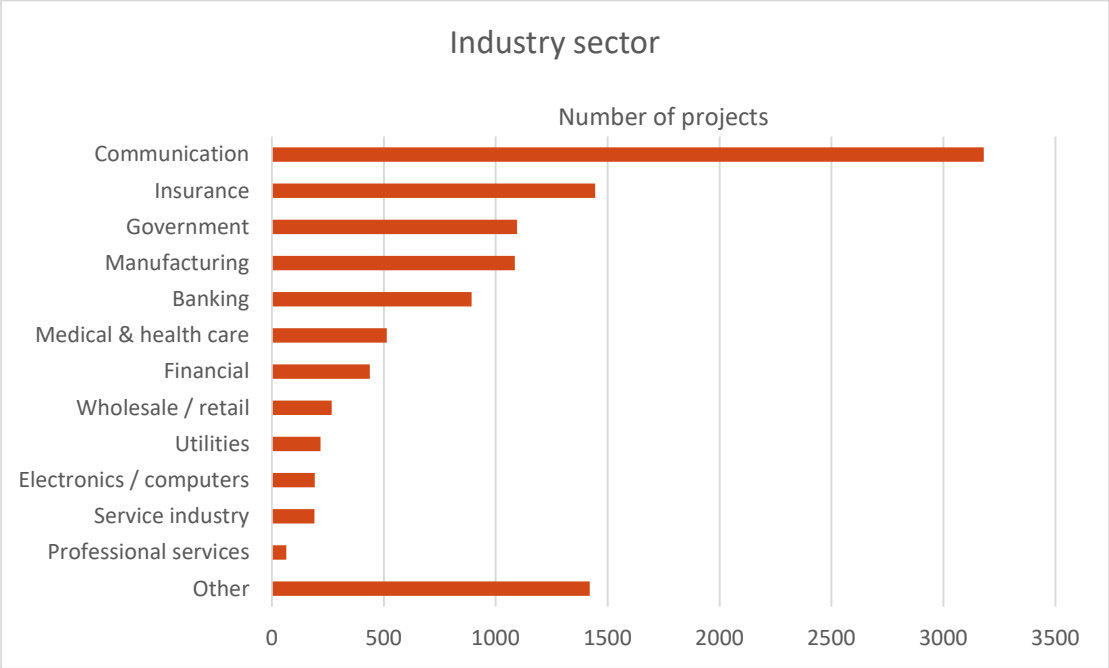

Figure 3 - Demographics industry sector

Demographics		
Industry sector	**Projects**	**Percentage**
Industries	**N**	**%**
Communication	3181	28.9%
Insurance	1445	13.1%
Government	1095	10.0%
Manufacturing	1085	9.9%
Banking	892	8.1%
Medical & health care	513	4.7%
Financial	437	4.0%
Wholesale / retail	267	2.4%
Utilities	217	2.0%
Electronics / computers	192	1.7%
Service industry	190	1.7%
Professional services	64	0.6%
Other	1420	12.9%
Total	**10998**	**100%**

Table 3 - Demographics industry sector

Business area

This is the business area within the organization/industry that the project/application will be supporting.

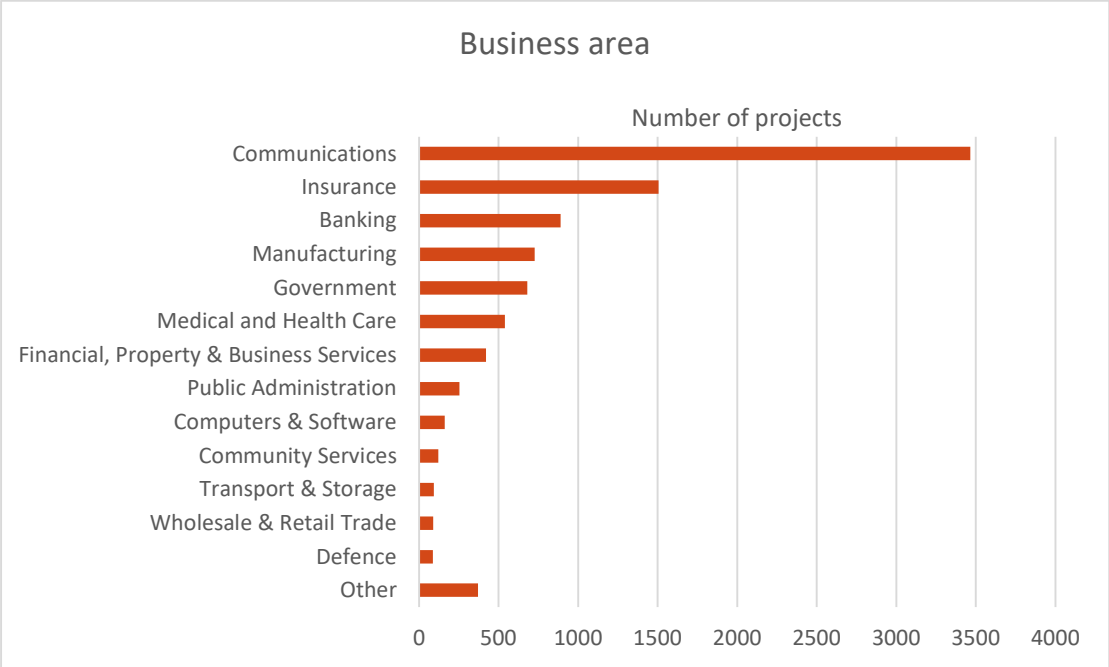

Figure 4 - Demographics business area

Demographics		
Business area	**Projects**	**Percentage**
Areas	**N**	**%**
Communications	3465	36.9%
Insurance	1505	16.0%
Banking	889	9.5%
Manufacturing	727	7.7%
Government	681	7.2%
Medical and Health Care	540	5.7%
Financial, Property & Business Services	421	4.5%
Public Administration	254	2.7%
Computers & Software	161	1.7%
Community Services	121	1.3%
Transport & Storage	93	1.0%
Wholesale & Retail Trade	89	0.9%
Defence	86	0.9%
Other	370	3.9%
Total	**9402**	**100%**

Table 4 - Demographics business area

Type of project

Development type

A detailed explanation of the development types is given in Appendices, Glossary of Terms.

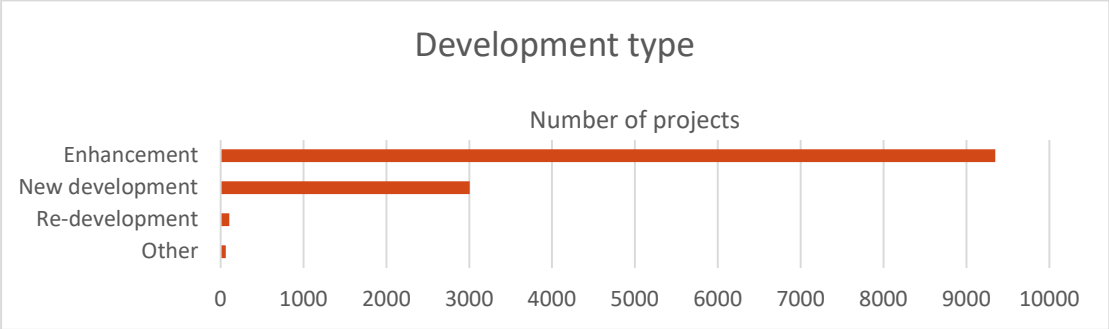

Figure 5 - Demographics development type

Demographics		
Development type	**Projects**	**Percentage**
Types	**N**	**%**
Enhancement	9350	74.7%
New development	3005	24.0%
Re-development	104	0.8%
Other	61	0.5%
Total	**12520**	**100%**

Table 5 - Demographics development type

Intended market

This defines the relationship between the customer, the project/application developer, and application user. If the customer and the developer are in the same organization, the project is assumed to be an in-house development; if the customer and user are in the same organization the project is assumed to be developed for internal use. For some projects, it is possible to determine whether the development was in-house or outsourced, or whether the users are internal or external, but not both.

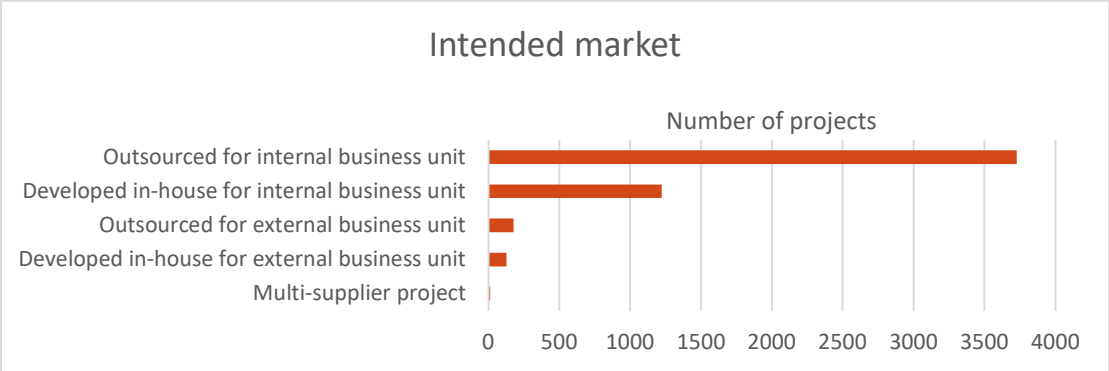

Figure 6 - Demographics intended market

Demographics		
Intended market	**Projects**	**Percentage**
Markets	**N**	**%**
Outsourced for internal business unit	3728	70.8%
Developed in-house for internal business unit	1223	23.2%
Outsourced for external business unit	178	3.4%
Developed in-house for external business unit	127	2.4%
Multi-supplier project	13	0.2%
Total	**5269**	**100%**

Table 6 Demographics intended market

Team size

This is the maximum number of people in the development team at any given time in the project.

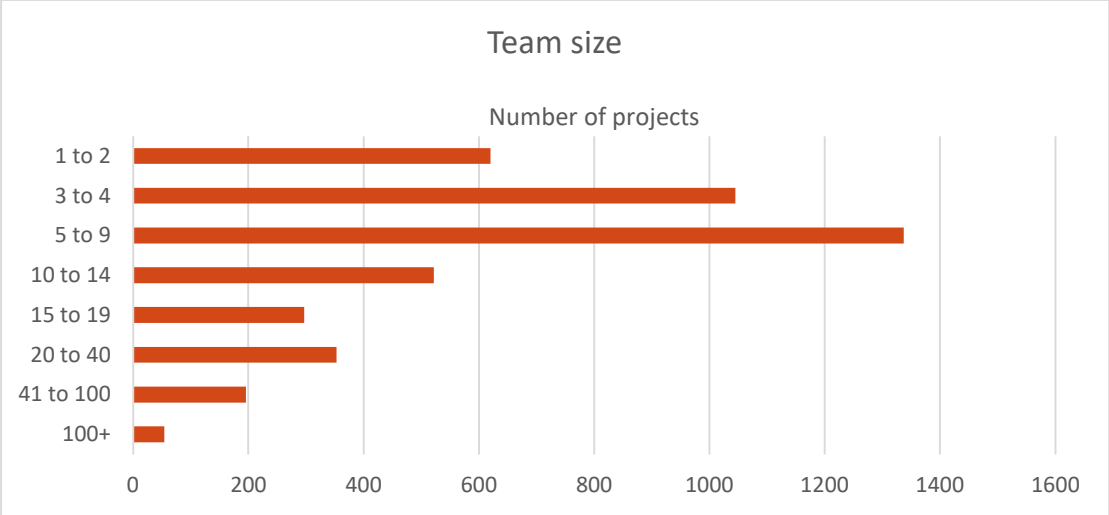

Figure 7 - Demographics team size

Demographics		
Team size	**Projects**	**Percentage**
Catergories	**N**	**%**
1 to 2	620	14.0%
3 to 4	1045	23.6%
5 to 9	1337	30.2%
10 to 14	522	11.8%
15 to 19	297	6.7%
20 to 40	353	8.0%
41 to 100	196	4.4%
100+	54	1.2%
Total	**4424**	**100%**

Table 7 - Demographics team size

Type of product

Product size

Size is measured in function points. The 4 main function point counting approaches represented in the Repository are IFPUG CPM 4.0 or later, COSMIC, FiSMA and NESMA. Other approaches represented in the Repository include Mark II, Feature Points, and older versions of IFPUG (IFPUG 2, IFPUG 3) but there are few such projects and very few have been contributed to the Repository for many years now.

The following tables and histograms show the range of project sizes, for each of these 4 function point counting approaches.

IFPUG 4

The table shows the sizes (in UFPs) of projects sized with IFPUG function points, that are known or presumed to have been sized using CPM4.0 or later.

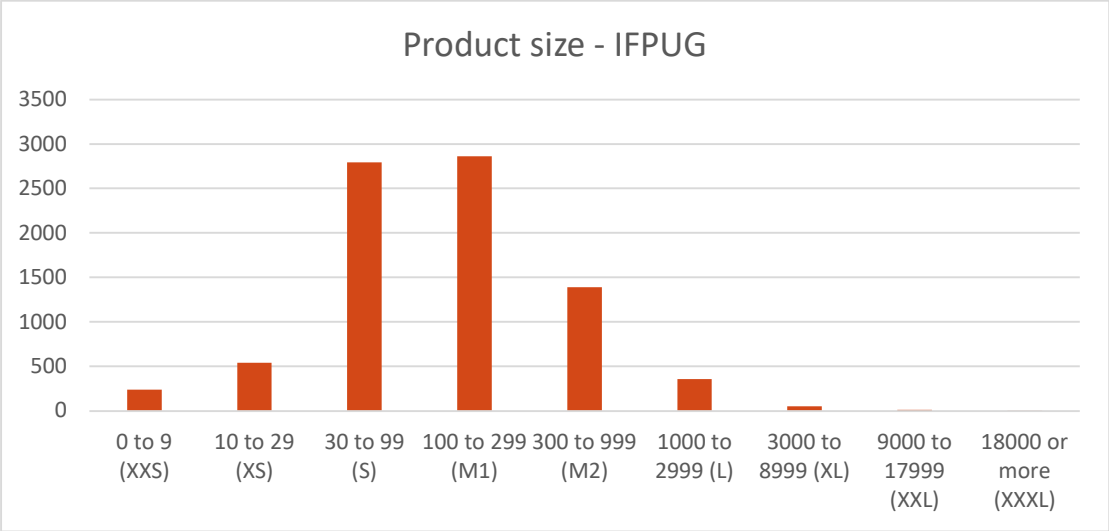

Figure 8 - Demographics product size IFPUG 4+

Demographics		
Product size IFPUG	**Projects**	**Percentage**
Catergories	**N**	**%**
0 to 9 (XXS)	237	2.9%
10 to 29 (XS)	541	6.6%
30 to 99 (S)	2795	33.9%
100 to 299 (M1)	2863	34.7%
300 to 999 (M2)	1389	16.8%
1000 to 2999 (L)	358	4.3%
3000 to 8999 (XL)	52	0.6%
9000 to 17999 (XXL)	10	0.1%
18000 or more (XXXL)	2	0.0%
Total	**8247**	**100%**

Table 8 - Demographics product size IFPUG 4+

COSMIC

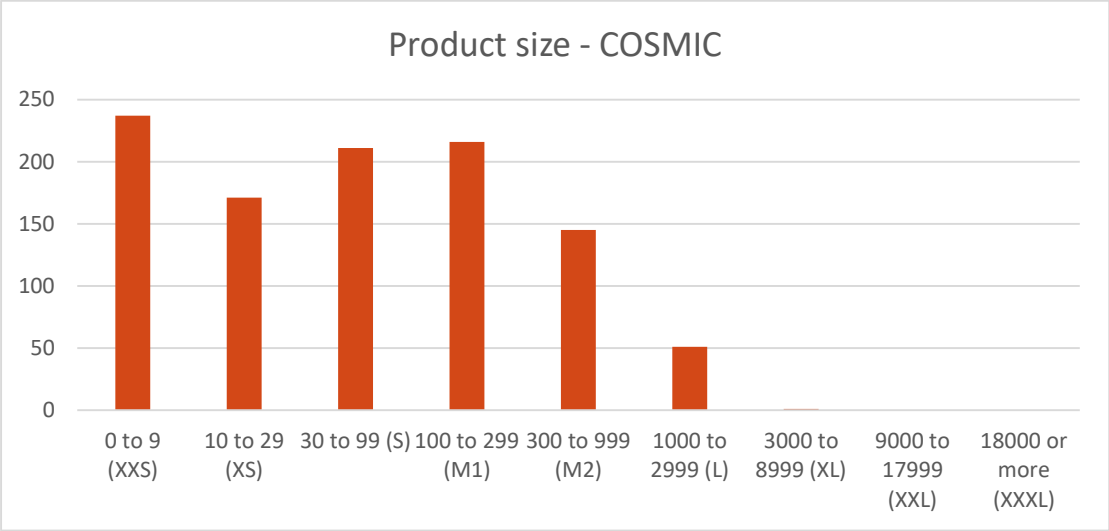

Figure 9 - Demographics product size COSMIC

Demographics		
Product size COSMIC	**Projects**	**Percentage**
Catergories	**N**	**%**
0 to 9 (XXS)	237	23.0%
10 to 29 (XS)	171	16.6%
30 to 99 (S)	211	20.4%
100 to 299 (M1)	216	20.9%
300 to 999 (M2)	145	14.1%
1000 to 2999 (L)	51	4.9%
3000 to 8999 (XL)	1	0.1%
9000 to 17999 (XXL)	0	0.0%
18000 or more (XXXL)	0	0.0%
Total	**1032**	**100%**

Table 9 - Demographics product size COSMIC

NESMA

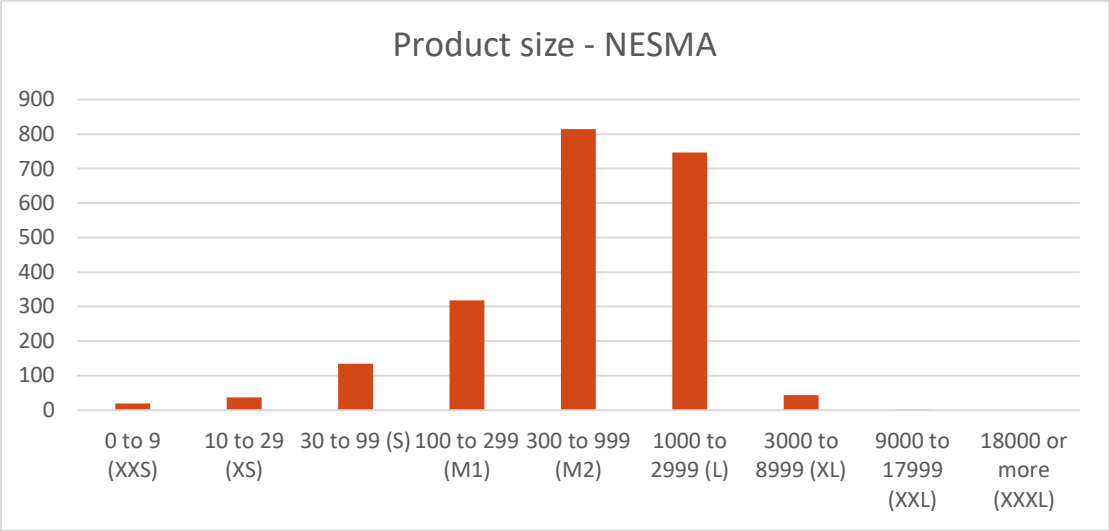

Figure 10 - Demographics product size NESMA

Demographics		
Product size NESMA	**Projects**	**Percentage**
Catergories	**N**	**%**
0 to 9 (XXS)	19	0.9%
10 to 29 (XS)	37	1.8%
30 to 99 (S)	134	6.3%
100 to 299 (M1)	318	15.0%
300 to 999 (M2)	815	38.6%
1000 to 2999 (L)	747	35.3%
3000 to 8999 (XL)	43	2.0%
9000 to 17999 (XXL)	1	0.0%
18000 or more (XXXL)	0	0.0%
Total	**2114**	**100%**

Table 10 - Demographics product size NESMA

FiSMA

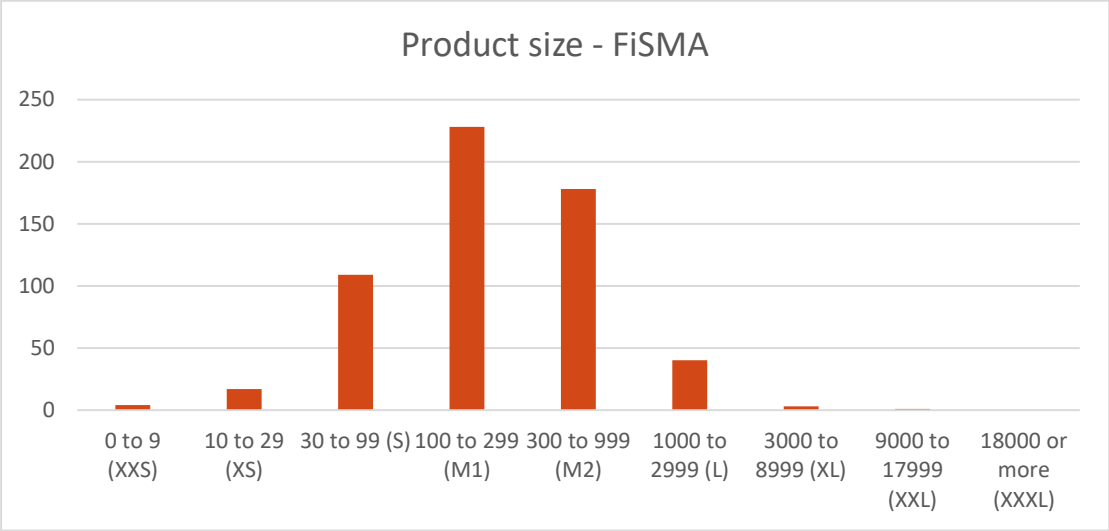

Figure 11 - Demographics product size FiSMA

Demographics		
Product size FiSMA	**Projects**	**Percentage**
Catergories	**N**	**%**
0 to 9 (XXS)	4	0.7%
10 to 29 (XS)	17	2.9%
30 to 99 (S)	109	18.8%
100 to 299 (M1)	228	39.3%
300 to 999 (M2)	178	30.7%
1000 to 2999 (L)	40	6.9%
3000 to 8999 (XL)	3	0.5%
9000 to 17999 (XXL)	1	0.2%
18000 or more (XXXL)	0	0.0%
Total	**580**	**100%**

Table 11 - Demographics product size FiSMA

Application group

The application type identifies the type of application being addressed by the project (e.g. information system, transaction/production system, process control.)

As there are hundreds of different application types recorded, they are grouped here into 4 groups.

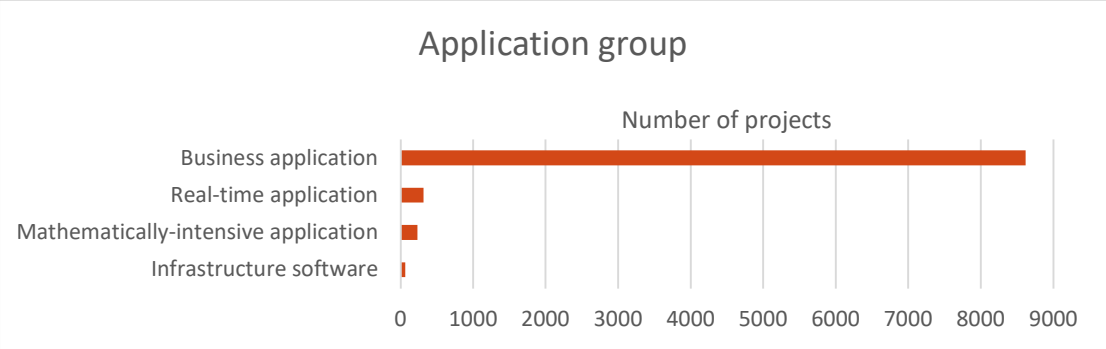

Figure 12 - Demographics application group

Demographics		
Application group	**Projects**	**Percentage**
Categories	**N**	**%**
Business application	8616	93.3%
Real-time application	319	3.5%
Mathematically-intensive application	235	2.5%
Infrastructure software	65	0.7%
Total	**9235**	**100%**

Table 12 - Demographics application group

Application type

A finer-grained breakdown of application types follows.

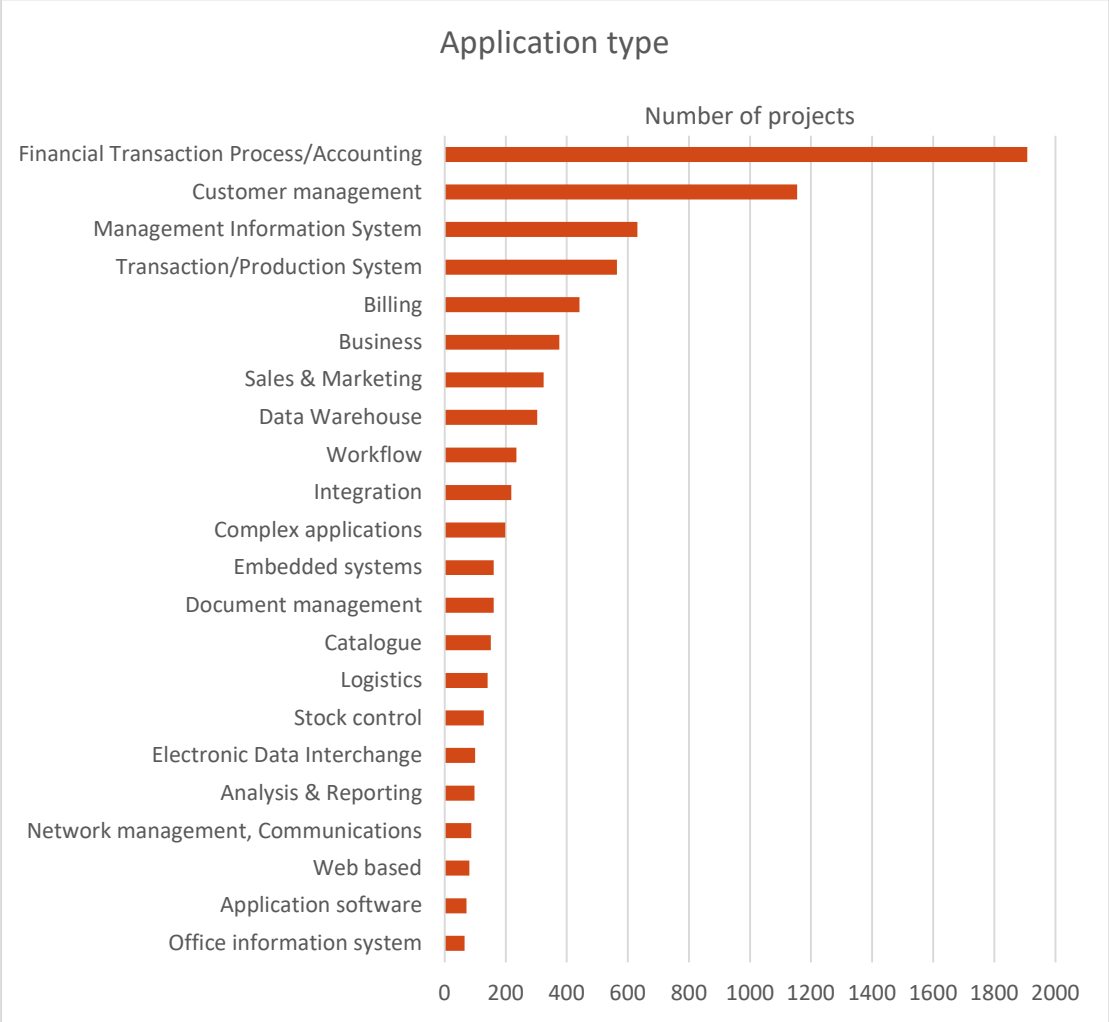

Figure 13 - Demographics application type

Demographics		
Application type	**Projects**	**Percentage**
Categories	**N**	**%**
Financial Transaction Process/Accounting	1908	25.1%
Customer management	1154	15.2%
Management Information System	631	8.3%
Transaction/Production System	564	7.4%
Billing	442	5.8%
Business	375	4.9%
Sales & Marketing	324	4.3%
Data Warehouse	303	4.0%
Workflow	235	3.1%
Integration	218	2.9%
Complex applications	198	2.6%
Embedded systems	161	2.1%
Document management	161	2.1%
Catalogue	151	2.0%
Logistics	141	1.9%
Stock control	128	1.7%
Electronic Data Interchange	100	1.3%
Analysis & Reporting	98	1.3%
Network management, Communications	87	1.1%
Web based	81	1.1%
Application software	71	0.9%
Office information system	65	0.9%
Total	**7596**	**100%**

Table 13 - Demographics application type

Architecture

Two broad types of system architecture are represented in the Repository: client-server (of various flavours), and multi-tier (of various flavours). Stand-alone systems are also recorded as a contrast to client-server systems.

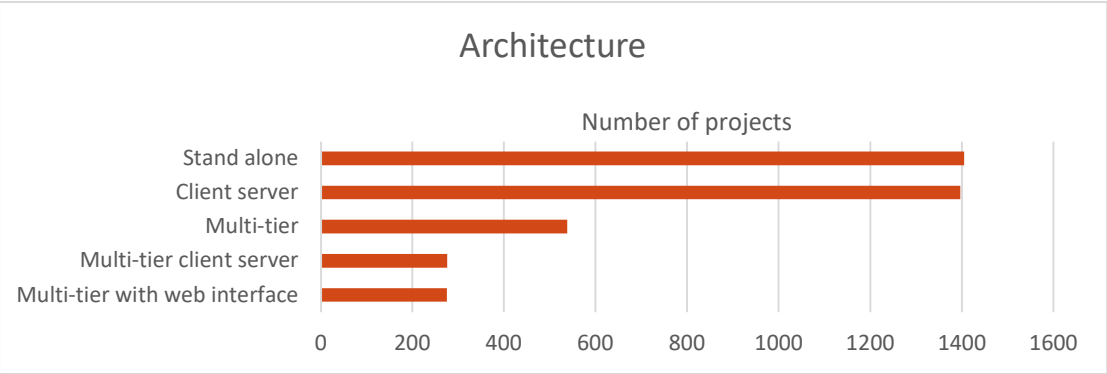

Figure 14 - Demographics architecture

Demographics		
Architecture	**Projects**	**Percentage**
Categories	**N**	**%**
Stand alone	1405	36.1%
Client server	1397	35.9%
Multi-tier	538	13.8%
Multi-tier client server	276	7.1%
Multi-tier with web interface	275	7.1%
Total	**3891**	**100%**

Table 14 - Demographics architecture

Development environment

Development platform

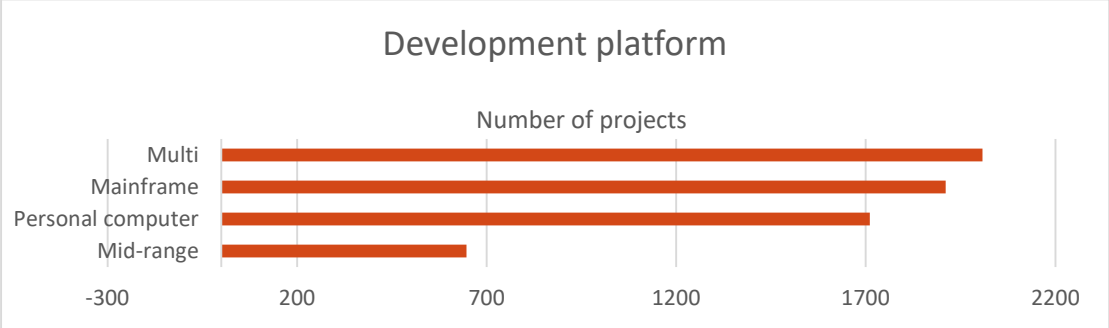

Figure 15 - Demographics development platform

Demographics		
Development platform	**Projects**	**Percentage**
Categories	**N**	**%**
Multi	2008	32.0%
Mainframe	1911	30.4%
Personal computer	1711	27.3%
Mid-range	647	10.3%
Total	**6277**	**100%**

Table 15 - Demographics development platform

Type of programming language

There are many languages recorded in the repository. This can make it difficult to compare some projects. Consequently, languages are classified by type as shown below.

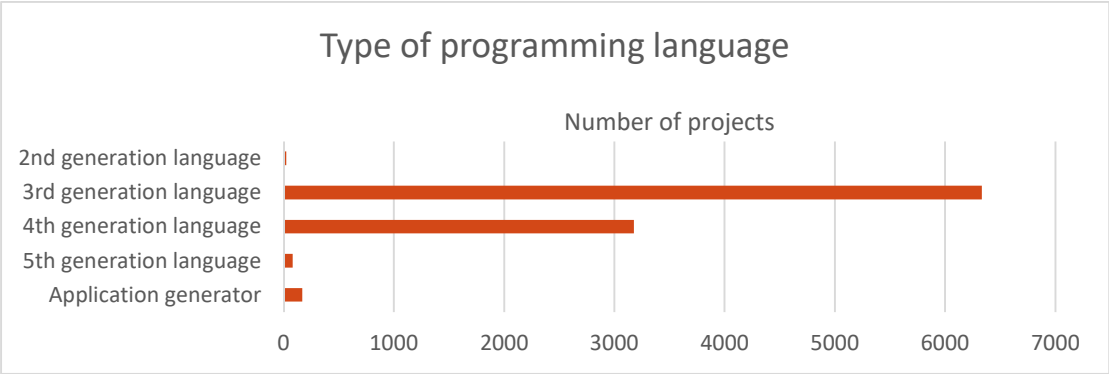

Figure 16 - Demographics type of programming language

Demographics		
Type of programming language	**Projects**	**Percentage**
Categories	**N**	**%**
2nd generation language	22	0.2%
3rd generation language	6334	64.7%
4th generation language	3178	32.5%
5th generation language	81	0.8%
Application generator	168	1.7%
Total	**9783**	**100%**

Table 16 - Demographics type of programming language

Over 160 programming languages are represented in the Repository. 3rd generation languages dominate. 4th generation languages are also very well represented and 5th generation languages such as low-code are starting to get significant number of projects.

Primary programming languages 3rd generation languages

This is the programming language that has been nominated by the project submitter as the primary programming language.

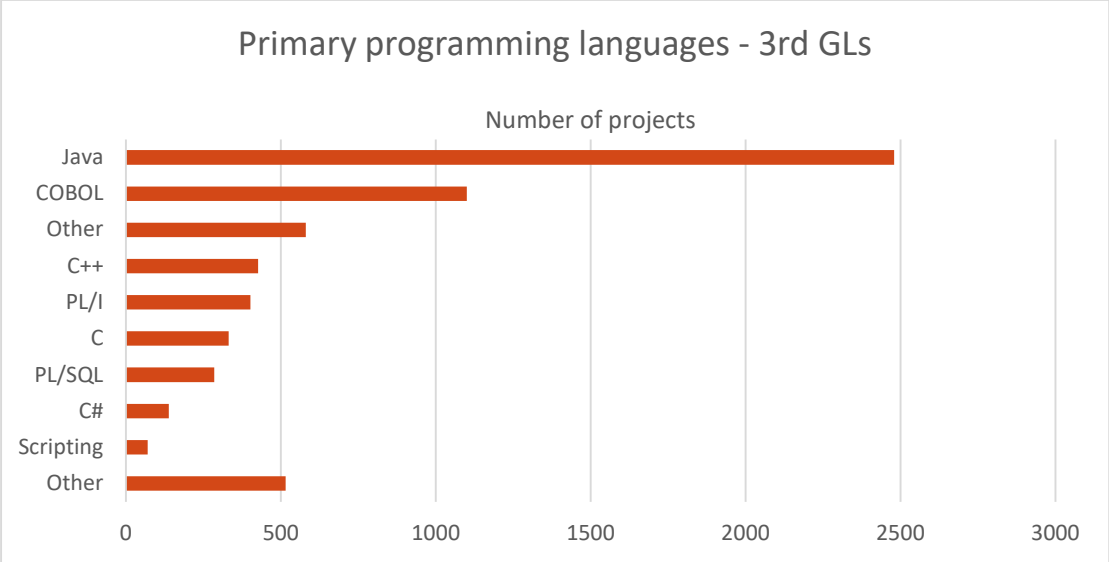

Figure 17 - Demographics primary programming languages 3rd generation languages

Demographics		
Primary programming languages	**Projects**	**Percentage**
3rd generation languages	**N**	**%**
Java	2480	39.2%
COBOL	1101	17.4%
Other	581	9.2%
C++	427	6.7%
PL/I	402	6.3%
C	332	5.2%
PL/SQL	285	4.5%
C#	139	2.2%
Scripting	71	1.1%
Other	516	8.1%
Total	**6334**	**100%**

Table 17 - Demographics primary programming languages 3rd generation languages

Other 3rd generation languages in the Repository include Python, PHP, TIBCO, Periphonics, HTML, Pro*C, C#.NET, RPG, JavaScript and Smalltalk.

Primary programming languages 4th generation languages

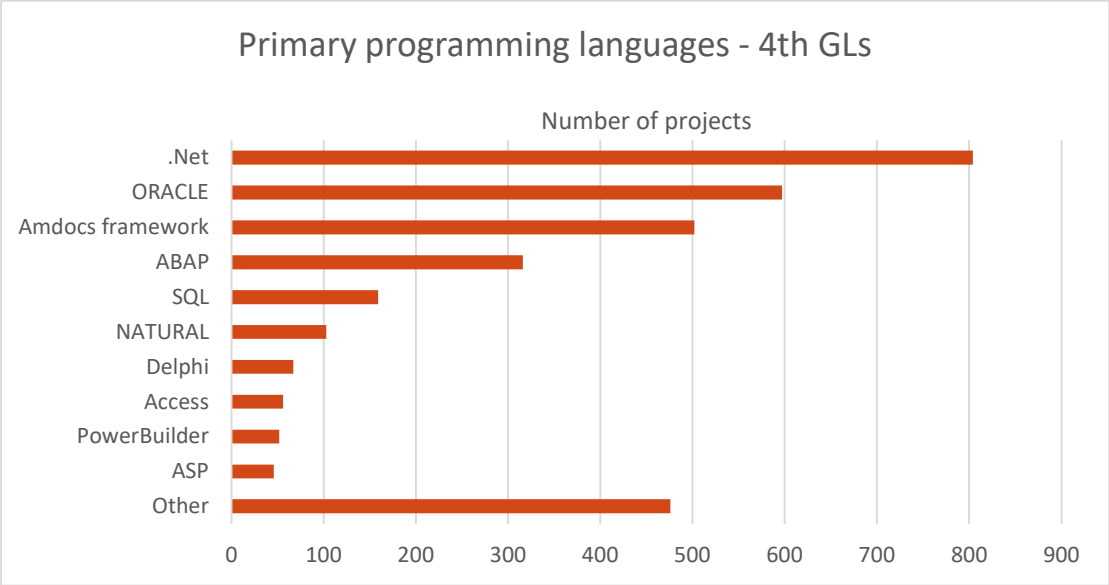

Figure 18 - Demographics primary programming languages 4th generation languages

Demographics		
Primary programming languages	**Projects**	**Percentage**
4th generation languages	**N**	**%**
.Net	804	25.3%
ORACLE	597	18.8%
Amdocs framework	502	15.8%
ABAP	316	9.9%
SQL	159	5.0%
NATURAL	103	3.2%
Delphi	67	2.1%
Access	56	1.8%
PowerBuilder	52	1.6%
ASP	46	1.4%
Other	476	15.0%
Total	**3178**	**100%**

Table 18 - Demographics primary programming languages 4th generation languages

Other 4GLs represented in the Repository include Siebel, Lotus Notes, Mendix, Visual C++, ASP.Net, EASYTRIEVE, FOCUS, CLIPPER and CSP.

Application generators

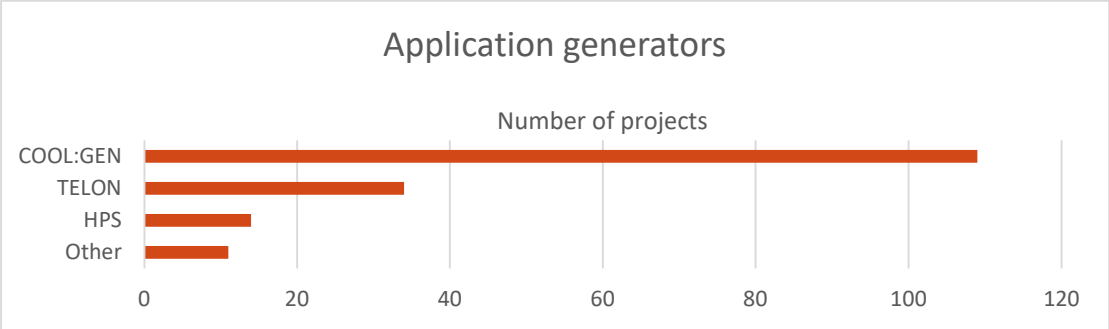

Figure 19 - Demographics application generators

Demographics		
Application generators	**Projects**	**Percentage**
Programming languages	**N**	**%**
COOL:GEN	109	64.9%
TELON	34	20.2%
HPS	14	8.3%
Other	11	6.5%
Total	**168**	**100%**

Table 19 - Demographics application generators

The most recent application generator projects are IVR.

Methodologies and Techniques

These describe the various methodologies and techniques that may have been used during the execution of a project. They have not been related to specific project activities, and therefore may apply to any part of the development lifecycle.

For ISBSG purposes a methodology (Agile, JAD, Waterfall etc.) applies to the whole project development process. This is distinct from techniques (Data Modelling, OO Analysis etc.), which apply to individual activities within the development process.

Some projects mention more than one methodology (e.g. some JAD projects also use RAD and/or timeboxing), and some mention more than one technique.

Methodology

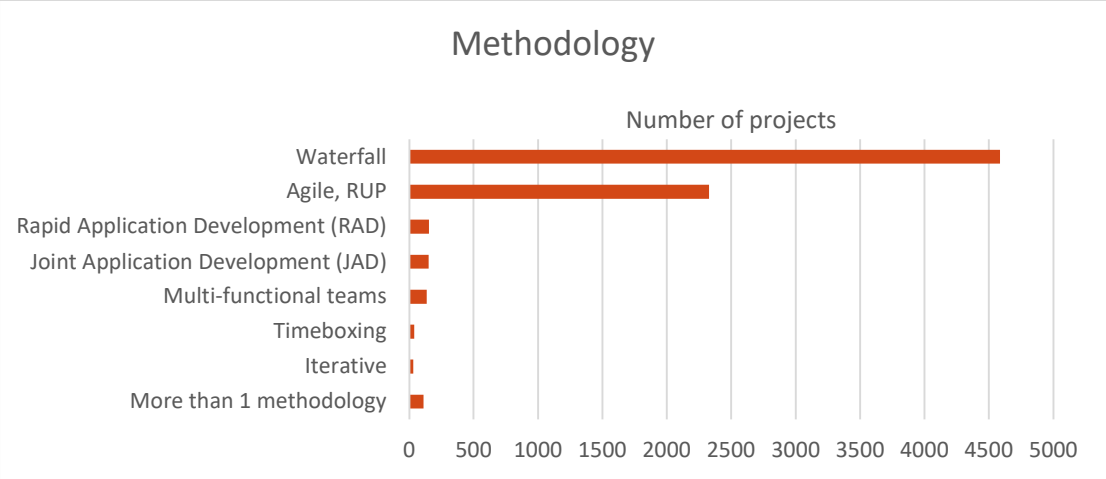

Figure 20 - Demographics methodology

Demographics		
Methodology	**Projects**	**Percentage**
Methodologies	**N**	**%**
Waterfall	4585	60.8%
Agile, RUP	2327	30.9%
Rapid Application Development (RAD)	153	2.0%
Joint Application Development (JAD)	152	2.0%
Multi-functional teams	137	1.8%
Timeboxing	39	0.5%
Iterative	32	0.4%
More than 1 methodology	110	1.5%
Total	**7535**	**100%**

Table 20 - Demographics methodology

Of the 152 JAD projects, 37 also mention RAD, 45 also mention multi-functional teams, and 9 also mention timeboxing.

Specification, design and development techniques

The following graph and table combine information from all three of these fields, as well as considering specification documents, and design documents.

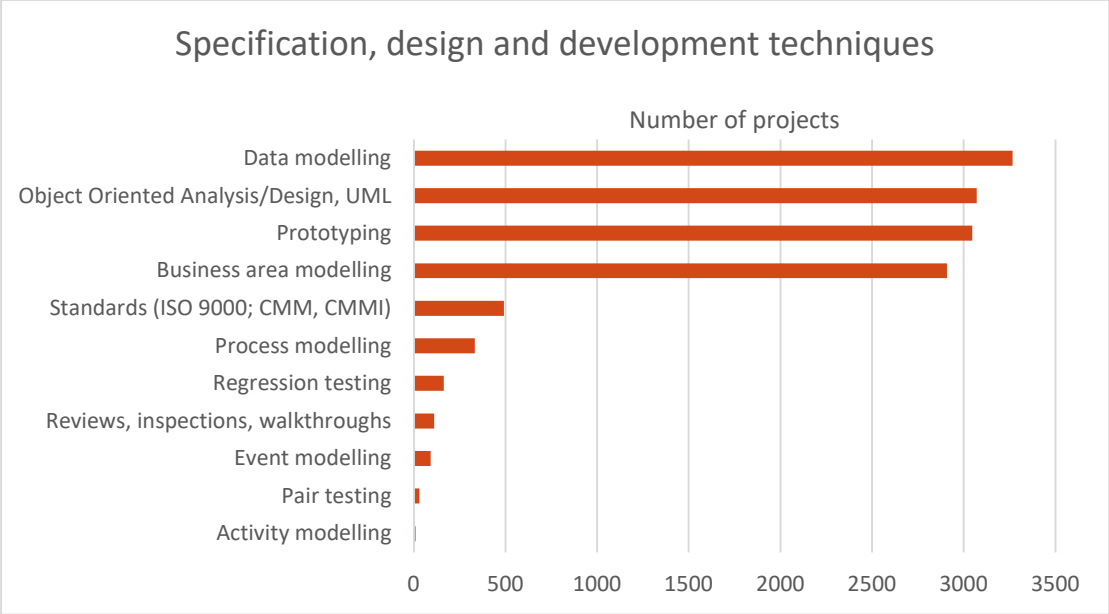

Figure 21 - Demographics specification, design and development

Demographics		
Specification, design and development techniques	**Projects**	**Percentage**
Techniques	**N**	**%**
Data modelling	3267	24.2%
Object Oriented Analysis/Design, UML	3071	22.7%
Prototyping	3047	22.5%
Business area modelling	2908	21.5%
Standards (ISO 9000; CMM, CMMI)	492	3.6%
Process modelling	332	2.5%
Regression testing	164	1.2%
Reviews, inspections, walkthroughs	111	0.8%
Event modelling	92	0.7%
Pair testing	31	0.2%
Activity modelling	9	0.1%
More than 1 development technique used	3466	25.6%

Table 21 - Demographics specification, design and development

Appendix 1 - ISBSG

The ISBSG is a not-for-profit organization founded in 1997 by a group of national software metrics associations. Their aim was to promote the use of IT industry data to improve software processes and products.

ISBSG is an independent international organization that collects and provides industry data of software development projects and maintenance & support activities in order to help all organizations (commercial and government, suppliers and customers) in the software industry to understand and to improve their performance. ISBSG sets the standards of software data collection, software data analysis and software project benchmarking processes and is considered to be the international thought leader in these practices.

The ISBSG mission is to help YOU and your organization improve the estimation, planning, control and management of your IT software projects and/or maintenance and support contracts.

To achieve this:

ISBSG maintains and grows 2 repositories of IT software development/maintenance & support data. This data originates from trusted, international IT organizations and can be obtained for a modest fee from the website https://www.isbsg.org/subscriptions/

Help us to collect data

ISBSG is always looking for new data. In return for your data submission, you receive a free benchmark report that shows the performance in your project or contract against relevant industry peers.

Please submit your data through one of the forms listed on https://isbsg.org/submit-data/

Partners

This page will help you to find an ISBSG partner in your country
https://www.isbsg.org/board/